SD-95277-010

SD-95277-01

DRAWING INDEX TABLE

	71A GENERATOR		71B GENERATOR		71C GENERATOR		71D NETWORK PANEL		71E NETWORK PANEL	
	FIG.	SHEET	FIG.	SHEET	FIG.	SHEET	FIG.	SHEET	FIG.	SHEET
CIRCUIT SCHEMATICS	1	012	2	012	8,9	012				
SIMPLIFIED CIRCUIT DIAGRAM	101	013			102	013				
MW SYSTEM BLOCK DIAGRAMS	103	013			104	013	104	013	104	013
CABLING DIAGRAMS	CAD. 1,7 CAD. 2	014			CAD. 3,4 CAD. 8	014 016	CAD. 5	015	CAD. 6	015
DISTRIBUTING NETWORKS (ADJUSTABLE)	6,7	013					6,7	013	6,7	013
DISTRIBUTING NETWORK MODIFICATION FOR +0.5 DBM	7,10,11	013					7,10,11	013	7,10,11	013
DISTRIBUTING NETWORKS (NONADJUSTABLE)	4,5	013								
CIRCUIT NOTES EQUIPMENT NOTES INFORMATION NOTES		011				011		011		011
LIST OF CONNECTING CIRCUITS	TABLE C	011			TABLE C	011	TABLE C	011	TABLE C	011
APPARATUS TERMINAL AND WIRING LOCATION TABLES A B, AND D		016								

DWG ISS	CD ISS	DWG ISS	CD ISS	DWG ISS	CD ISS
1	1	2A	2A	3D	3D
4D	4D	5B	4D APP 1D	6D	4D APP 2D
7A	4D APP 3D	8D	5D	9A	5D APP 1D
10B	5D APP 2D				

DWG ISS	CD ISSUE	DATE ISSUED	[illegible]	APPD
11B	6B	10-1-62	TRS AA	RJK BCB REJ
12B	6B APP 1B	12-22-64	JF REZ	PJK BCB TEB
13B	6B APP 2B	8-25-66	GS DJG	RJK JJK WPO

J94071E ( )
J94071D ( )
J94071C ( )
J94071B ( )
J94071A ( )
EQUIPMENT INFO.

13

REPLACING SD-95000-01 & SD-95000-02

SD-95277-01

COMMON SYSTEMS

TRANSMISSION MEASURING
MILLIWATT DISTRIBUTING CKT

USING 71 TYPE MILLIWATT REFERENCE
GENERATOR

(71A,71B & 71C MW REF GEN)
(71D & 71E NETWORK PANELS)

②

AT&TCO
STANDARD

BELL TELEPHONE LABORATORIES
INCORPORATED

6S

SD-95277-010
7 SHEETS

⑥

31

21

CIRCUIT NOTES:

101.

DESIG	FUSE AMP	POTENTIAL	ONE PER
A	1-1/3	48V SIG	MAX.ONE FIG.1 OR MAX.ONE FIGS.8 & 9

BATTERY SYMBOL	VOLTAGE RANGE
-48	45-50V SIG

71A-CURRENT DRAIN IS ABOUT 23 MA AT 48 VOLTS
71C-CURRENT DRAIN IS ABOUT 80 MA AT 48 VOLTS

102.

FEATURE OR OPTION		PROVIDE		
		FIG.	APP OR WIR	QUANTITY
GENERATOR	GEN(J94071A)	1,CAD 1 *	SEE TABLES B & D	ONE PER 1-4 NETWORKS
	(J94071C)	8,9		ONE PER 1-50 NETWORKS
KS-16744 DISTRIB NETWORKS	900Ω NON-ADJUSTABLE	4(MD)		AS SPEC 1-4 SERVED BY FIG.1 1-50 SERVED BY FIG.9
	600Ω NON-ADJUSTABLE	5(MD)		
	900Ω ADJUSTABLE	6(MD),10(MD)	SEE NOTE 111	
	600Ω ADJUSTABLE	7,11		

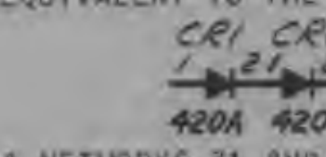
*PRIOR TO ISSUE 3D, CAD 1 WAS FIG.3.

103. DISTRIBUTING NETWORKS FOR ONE TO FOUR OUTLETS ARE PROVIDED AND INSTALLED AS SHOWN IN NOTE 102 AND TABLES A,B AND D.

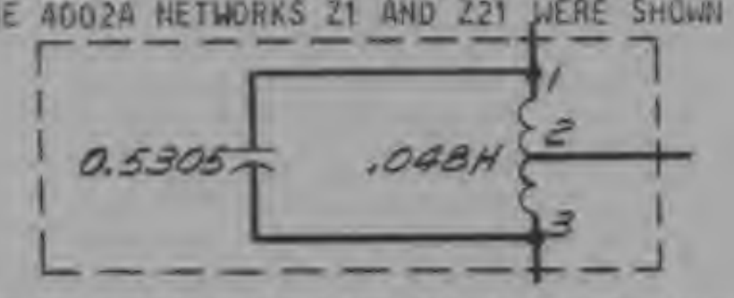
104. RESISTOR (R33) IS FOR "A" OR "B" OPTION AS DETERMINED BY FACTORY TEST. NO RECORD REQUIRED.

105. FOR RECORD OF FIGURES, WIRING AND APPARATUS CHANGES, SEE TABLE ON EXTREME RIGHT SIDE OF THIS SHEET.

106. PRIOR TO ISSUE 3D THE (CR1) DIODES IN FIG.1 AND SIMILARLY IN FIG.2 FOR (CR21). THE DIODES WERE SHOWN THUSLY AND WERE ELECTRICALLY EQUIVALENT TO THE 433A BY SELECTION.



ALSO THE 4002A NETWORKS Z1 AND Z21 WERE SHOWN THUSLY:



107. PROVIDE "LL" OPTION IN FIGS.4,5,6 AND 7. WHEN THE DISTRIBUTING NETWORK IS CONNECTED TO THE GENERATOR AND NOT SERVING A CONNECTING CIRCUIT.

108. ON ISSUE 4D, FIG.9 WAS PART OF FIG.8.

109. PRIOR TO ISSUE 6D THE JACK DESIGNATIONS IN FIGS.1,8,101 AND 102 WERE SHOWN THUSLY:

$\begin{pmatrix}600\\ \text{OUTPUT}\end{pmatrix}$, AND IN FIG.2 THUSLY: (OUTPUT) $\begin{matrix}(600) & J21\\ (900) & J22\end{matrix}$

110. PRIOR TO ISSUE 6D THE THERMISTOR IN FIG.8 WAS SHOWN AS TWO 3A THERMISTORS, RT1 AND RT2.

111. DESIGNATIONS "T,R" BECOME "T1,R1" WHEN ANY NETWORK PER FIG.7 IS USED WITH FIG. 11 TO PROVIDE 0.5 DBM INTO 600 OHMS AS REQUIRED BY SD-68446-01 AND SD-95698-01 (ISSUE 9 OR LATER).

112. FS1618 TRANSISTORS WITH A MAXIMUM BASE RESISTANCE OF 60 OHMS WERE USED IN EARLY PRODUCTION UNITS.

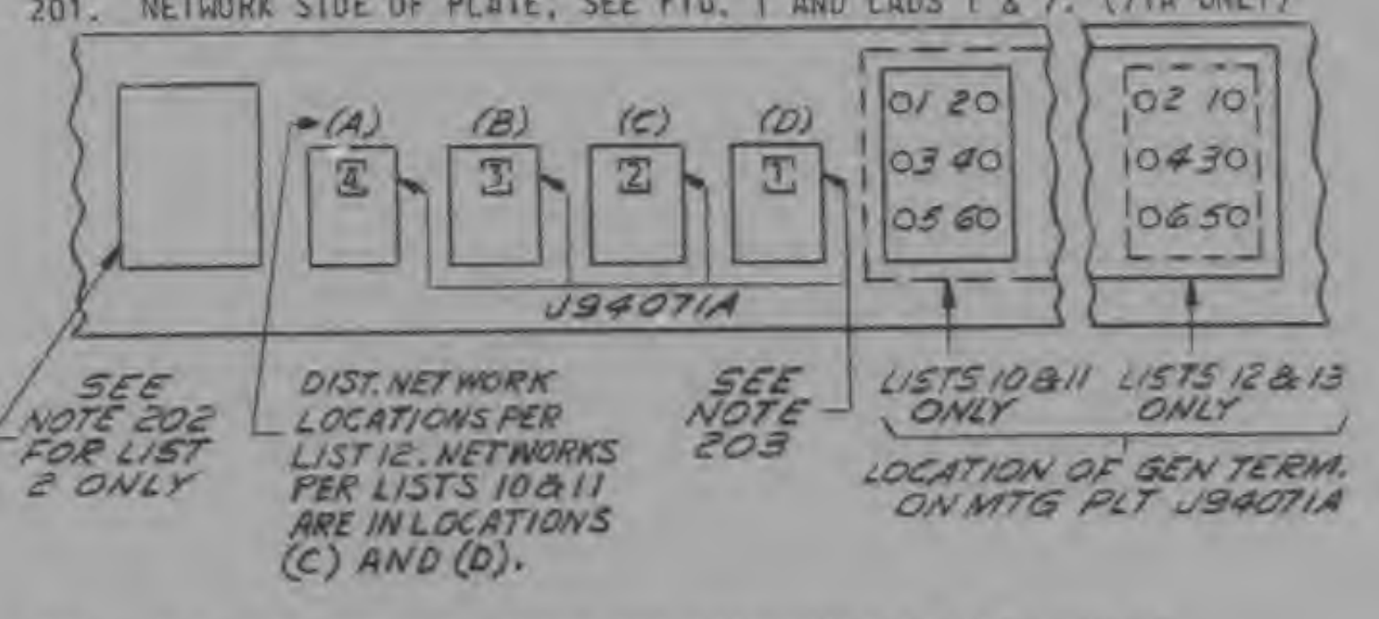
113. LOOP RESISTANCE OF WIRING BETWEEN THE TERMINAL STRIP ON THE MW REF. GEN. AND THE TERMINAL STRIP ON THE DISTRIBUTING NETWORK PANEL SHALL BE LESS THAN 0.5 OHM.

114. THE DISTRIBUTING NETWORK IN FIG. 7 IS USED FOR 600-OR 900-OHM APPLICATIONS OR AS A SPARE. A PARTICULAR APPLICATION DETERMINES CONNECTIONS ON THE NETWORK ACCORDING TO OPTIONS "D" AND "LL". REFER TO TABLE E FOR NETWORK OPTIONS.

115. THE "C" STRAPS ON FIG. 6 AND 7 ARE CONNECTED ACCORDING TO BSP 103-335-513 TO COMPENSATE FOR OFFICE WIRING AND EQUIPMENT LOSS.

EQUIPMENT NOTES:

201. NETWORK SIDE OF PLATE, SEE FIG. 1 AND CADS 1 & 7. (71A ONLY)



(A)
(B)
(C)
(D)
1
3
2
4
01 20
03 40
05 60
02 10
04 30
06 50
J94071A
SEE NOTE 202 FOR LIST 2 ONLY
DIST. NETWORK LOCATIONS PER LIST 12. NETWORKS PER LISTS 10&11 ARE IN LOCATIONS (C) AND (D).
SEE NOTE 203
LISTS 10&11 ONLY
LISTS 12&13 ONLY
LOCATION OF GEN TERM. ON MTG PLT J94071A

202. THE UNIT TERMINAL STRIP AND ASSOCIATED BRACKET MAY BE MOUNTED EITHER ON APPARATUS SIDE OR ON WIRING SIDE, IN ACCORDANCE WITH 71A, DEPENDING UPON TYPE OF BAY IN WHICH UNIT IS INSTALLED.

203. DISTRIBUTING NETWORK DESIGNATIONS (1,2,3,4) SHALL BE RUBBER STAMPED BY THE INSTALLER IN 1/8 INCH CHARACTERS ON EACH NETWORK IN APPROXIMATE LOCATION SHOWN.

204. TWO SEPARATE T9-R9 PAIRS SHALL BE RUN FROM TERMINALS 2-1 OF THE T1 REPEATING COIL TO THE UNIT TERMINAL STRIP AND TWO SEPARATE PAIRS SHALL BE USED TO CONNECT TERMINALS 5-6 OF THE T1 REPEATING COIL TO RESISTORS R11 TO R18 INCLUSIVE AND TO RESISTORS R7 AND R8.

205. EARLY PRODUCTION UNITS OF THE 71A WERE WIRED PER CAD.1 AND CAD.2 EXCEPT THAT NUMBERING OF TERMINALS 1 TO 32 STARTED AT BOTTOM OF TERMINAL STRIP. CAD.7 APPLIED ON ISSUE 8D WITH BATTERY AND GROUND LEADS CONNECTED IN BOTTOM ROW WITH UNUSED TERMINAL 3 BETWEEN.

206. WHEN PRACTICAL, THE GENERATOR AND NETWORK PANELS SHOULD BE MOUNTED AT A CONVENIENT WORKING LEVEL TO FACILITATE INITIAL AND PERIODIC TESTS PER BSP 103-335-300.

207. DISTRIBUTING NETWORKS PER FIG. 7 ARE MOUNTED AND MULTIPLIED IN GROUPS OF FIVE (5) ON 71D AND 71E NETWORK PANELS, WITH A MAXIMUM OF TWO (2) GROUPS PER PANEL. NETWORKS PER FIG. 6 AND 7 OF THIS DRAWING ARE IDENTICAL TO THAT OF FIG. 3 OF SD-95277-02.

208. PRIOR TO ISSUE 14B, 263A RESISTORS WERE 145C OR 221A RESISTORS. IN ALL CASES OF REPAIR OR REPLACEMENT, WHEN 145C OR 221A RESISTORS ARE REPLACED THEY SHALL BE REPLACED WITH 263A RESISTORS.

INFORMATION NOTES:

301. UNLESS OTHERWISE SPECIFIED RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN MICROFARADS.

302. OFFICE RECORD NEED NOT BE MAINTAINED FOR "C","D" OR "LL" OPTIONS ON DISTRIBUTING NETWORKS (NOTE 115). RECORD OF THESE OPTIONS SHALL BE KEPT IN MILLIWATT RECORD BOOK ED-95166.

303. ALL CONNECTING CIRCUITS ON WHICH DC MAY, UNDER ANY CIRCUMSTANCES, BE PRESENT SHALL BE EQUIPPED WITH BLOCKING-CAPACITORS. AN EXCEPTION TO THIS IS GROUND CROSS DETECTING CIRCUIT SD-1A231-01.

304. ALL CONNECTING UNITS SHALL BE TERMINATED IN 600 OR 900 OHMS RESISTANCE AT ALL TIMES, SUCH AS A CIRCUIT UNDER TEST, EXCEPT WHEN PROVIDED WITH A SENDING PAD OF 15 DB OR MORE LOSS.

305. ALL CONNECTING CIRCUITS USED FOR TESTING WHERE AN OPEN CIRCUIT, A SHORT CIRCUIT OR A LOW IMPEDANCE TERMINATION MAY OCCUR ACROSS THE CONNECTING CIRCUIT SHALL BE PROVIDED WITH A SENDING PAD OF 15 DB OR MORE LOSS.

306. SENDING APPEARANCES FOR CONNECTING CIRCUITS SHALL NOT BE MULTIPLED EXCEPT AT MANUAL SWITCHBOARDS HAVING ADEQUATE BUSY TEST FEATURES.

307. THE FOLLOWING AREAS SHOULD HAVE EXCLUSIVE USE OF A MILLIWATT DISTRIBUTING SYSTEM: TOLL TESTBOARD, SWITCHING, MANUAL SWITCHBOARD, VOICE FREQ PATCH BAY, CARRIER EQUIPMENT, PRIVATE LINE TESTBOARD, PROGRAM, TELEGRAPH TEST AND ANY EQUIPMENT AREA NOT LOCATED NEAR OR UNDER CONTROL OF THE AREAS LISTED ABOVE. THIS LATTER EQUIPMENT AREA MAY CONTAIN THE FOLLOWING GROUPS OF EQUIPMENT: ECHO SUPPRESSOR BAYS, REPEATER BAYS, SIGNALING BAYS, ANNOUNCEMENT SYSTEMS, SERVICE OBSERVING EQUIPMENT, ATTC AND ASSOCIATED TEST FRAMES, AND MANUAL AND/OR AUTOMATIC TEST FRAMES.

308. THE ADMINISTRATION OF ALL OUTLETS FROM ONE MILLIWATT DISTRIBUTING SYSTEM SHOULD BE LIMITED TO A SINGLE PLANT ORGANIZATION WITHIN AN OPERATING COMPANY, ON THE SAME FLOOR AND IN THE SAME AREA OF THE BUILDING.

309. ALL CIRCUIT COMPONENTS ON THIS DRAWING HAVE BEEN CHOSEN FOR TEMPERATURE PERFORMANCE. COMPONENTS OF A DIFFERENT CODE OR UNCERTAIN TEMPERATURE CHARACTERISTICS SHOULD NOT BE SUBSTITUTED IN THE CIRCUIT COVERED BY THIS DRAWING WITHOUT CONSIDERATION OF THE EFFECTS ON OVERALL MILLIWATT DISTRIBUTING STABILITY.

310. ON DRAWING COVERING CIRCUITS CONNECTING TO AN OUTLET OF THE 71-TYPE GENERATOR, THE FREQUENCY, LEVEL, AND IMPEDANCE REQUIRED BY THE CONNECTING CIRCUIT SHOULD BE DESIGNATED AS FOLLOWS:

TO MILLIWATT DIST CKT

(FREQUENCY) (LEVEL) (IMPEDANCE)

TABLE C

A PARTIAL LIST OF CONNECTING CKTS TO M.W. DIST CKT SEE NOTES 304,305,306 & 310	
SD-59432-01	TRANS.MEAS.CKT.(VF CHAN PATCH BAYS)
SD-59433-01	NOISE MEAS.CKT.(VF CHAN PATCH BAYS)
SD-59972-01	MAINT.CKT.(TASI)
SD-68095-01	TEST LINE CKT.(4W INTERTOLL)(MFR DISC.)
SD-68445-01	ANNOUNCEMENT SYSTEM NO. 5A
SD-68446-01	AUTOMATIC TRANS.T&C CKT.(SEE NOTE 111)
SD-68544-01	JACK CKT. T.T. UNIT NO. 5
SD-95101-01	SENDING JACK CKTS.
SD-95147-01	SENDING PAD CKTS.
SD-95162-01	REPEATER MEAS.CKT.(Vi & Vg)
SD-95162-02	1000 CPS OUTLETS,REC.JACKS & CONTROLS
SD-95608-01	ANNOUNCEMENT SYSTEM NO.6A
SD-95698-01	TRANS.& NOISE CHK.CKT.(SEE NOTE 111)
SD-95900-01	TRANS.& NOISE MEAS.CKT.(TESTBOARDS)
SD-96519-01	TEST & MON.CKT.(FOR SIGNALING)
SD-97118-01	N2 CARRIER TELEPHONE APPLICATION SCHEM.
SD-98100-01	TRANS.TEST LINE CKTS.
SD-95779-01	MF PULSING RECEIVER ADJUSTING CKT
SD-96000-01	TEST LINE CIRCUIT
SD-32521-01	SXS ROTL CIRCUIT

DWG ISS	CD ISS	DWG ISS	CD ISS	DWG ISS	CD ISS
1	1	2A	2A	3D	3D
4D	4D	5D	4D APP 1D	6D	[illegible]

DWG ISS	CD ISSUE	DATE ISSUED	DRAWN	APPD
7A	4D APP 3A	12-19-61	[illegible]	PFJ BCB JJM
8D	5D	2-19-61	[illegible]	PFJ BCB JJM
9A	5D APP 1A	5-11-62	[illegible]	PJK BCB JJM
10B	5D APP 2B	5-11-62	[illegible]	PJK BCB JJM

DRAWING ISSUE	
11B	TMS AA KEJ
12B	JF AEZ TEB
13B	GS DJG WPD

MH

RECORD OF FIGURES, WIRING AND APPARATUS CHANGES							
CHANGED ON ISS	IF JOB RECORDS DO NOT SPECIFY	THIS OPTION WAS FURN	SEE NOTE	USE IN CIRCUIT			
				STD	A&M	MD	
3D	FIG.6 OR 7	FIG.4 OR 5		FIG.6 & 7		FIG.4 & 5	
	433A DIODE	420A DIODE	106	433A DIODE		420A DIODE	
	LL	NONE	107	LL			
4D	FIG. 8	NONE		FIG. 8			
5D	FIG. 9		108	FIG. 9			
6D	FIG.10,11	NONE	111	FIG.10,11			
8D	E OR F IN FIGS.1 & 2	E		F		E	
10B	G OR H	G	112	H		G	
11B	FIG.6 OR 7	FIG. 6	114	FIG. 7		FIG. 6	
	J OR K	J		K		J	
	M OR N	M		N		M	
12B	P OR Q	P		Q		P	
	R OR S	R		S		R,FIG.10	
14B	T OR U	T		U		T	
	RESISTORS		208	263A		145C,221A	

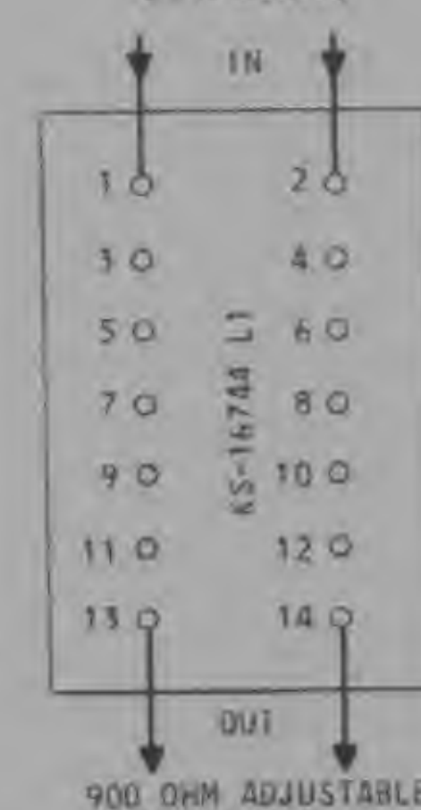
TABLE E (SEE NOTE 114 AND FIG. 7)

IF ORDER SPECIFIES NETWORK APPLICATION FOR:	FURNISH OPTION
600 OHMS	D AND REMOVE LL
900 OHMS	REMOVE LL
SPARE	LL

HIGHEST RES AND CAP. USED ON THIS DWG			
FIGS.1 & 2		FIGS.8,9,10 & 11	
R36	C22	R25	C2
NOT USED		NOT USED	
R7-R9	C3-C20		
R14-R20			
R27-R29			

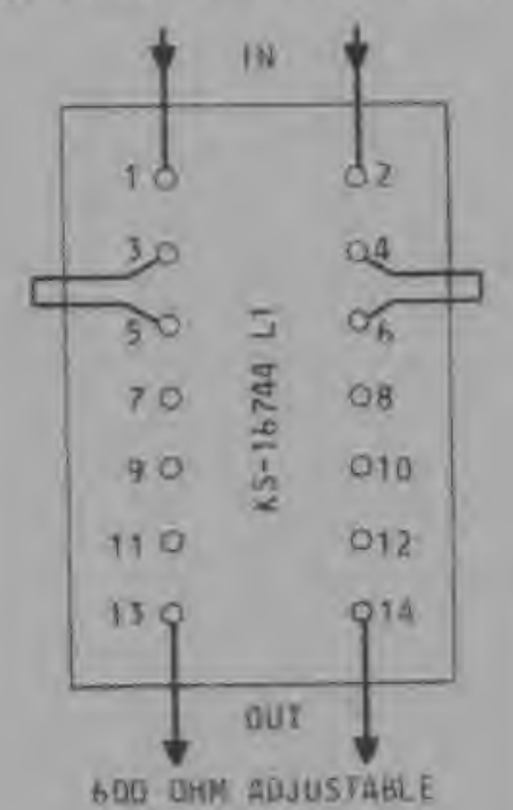
CHASSIS GRD

SK 6A
(MFR DISC.)



900 OHM ADJUSTABLE
M.W.OUTLET

SK 7A
(MFR DISC.)
(SHOWING "D" OPTION-FIG.7)



600 OHM ADJUSTABLE
M.W. OUTLET

ISSUE
14B

MILLIWATT DISTRIBUTING CKT

SD-95277-01-1

BELL TELEPHONE LABORATORIES
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6S

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SD-95277-01-1

EI ENGLE

FIG. 1

J94071A L1
SEE NOTES 201 & 202

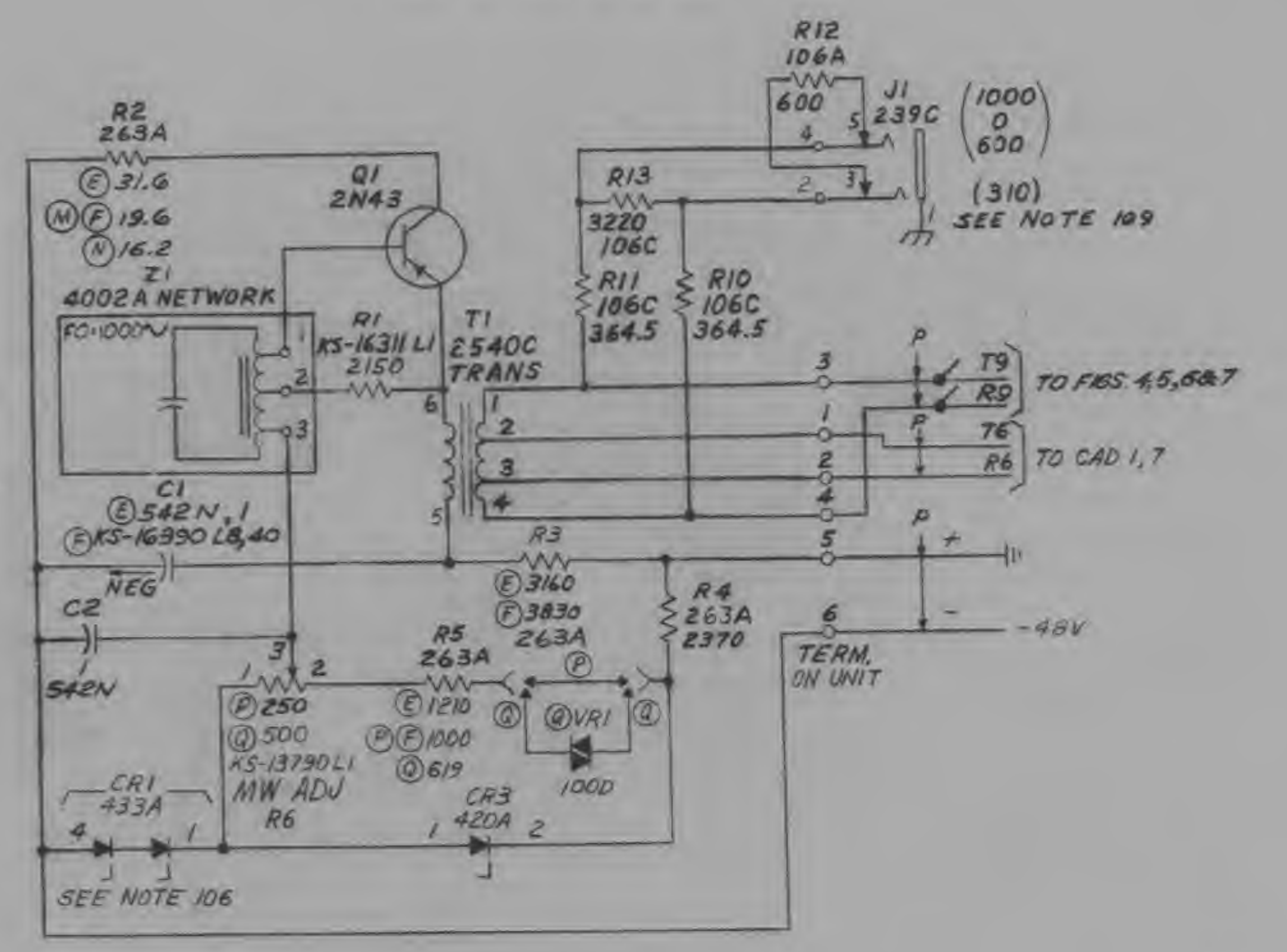


FIG. 8 (MFR DISC.)

GENERATOR CIRCUIT
J94071C L1

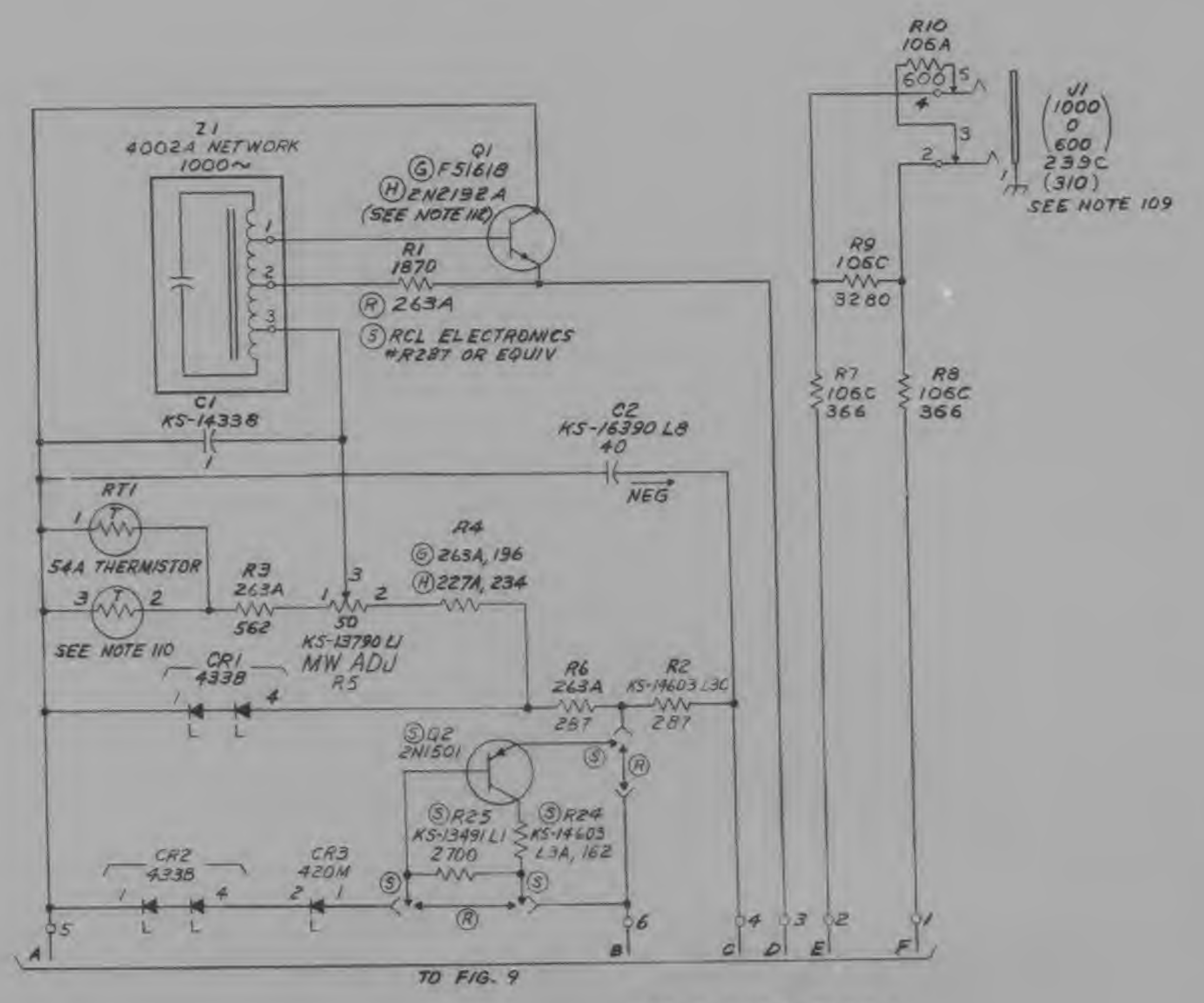
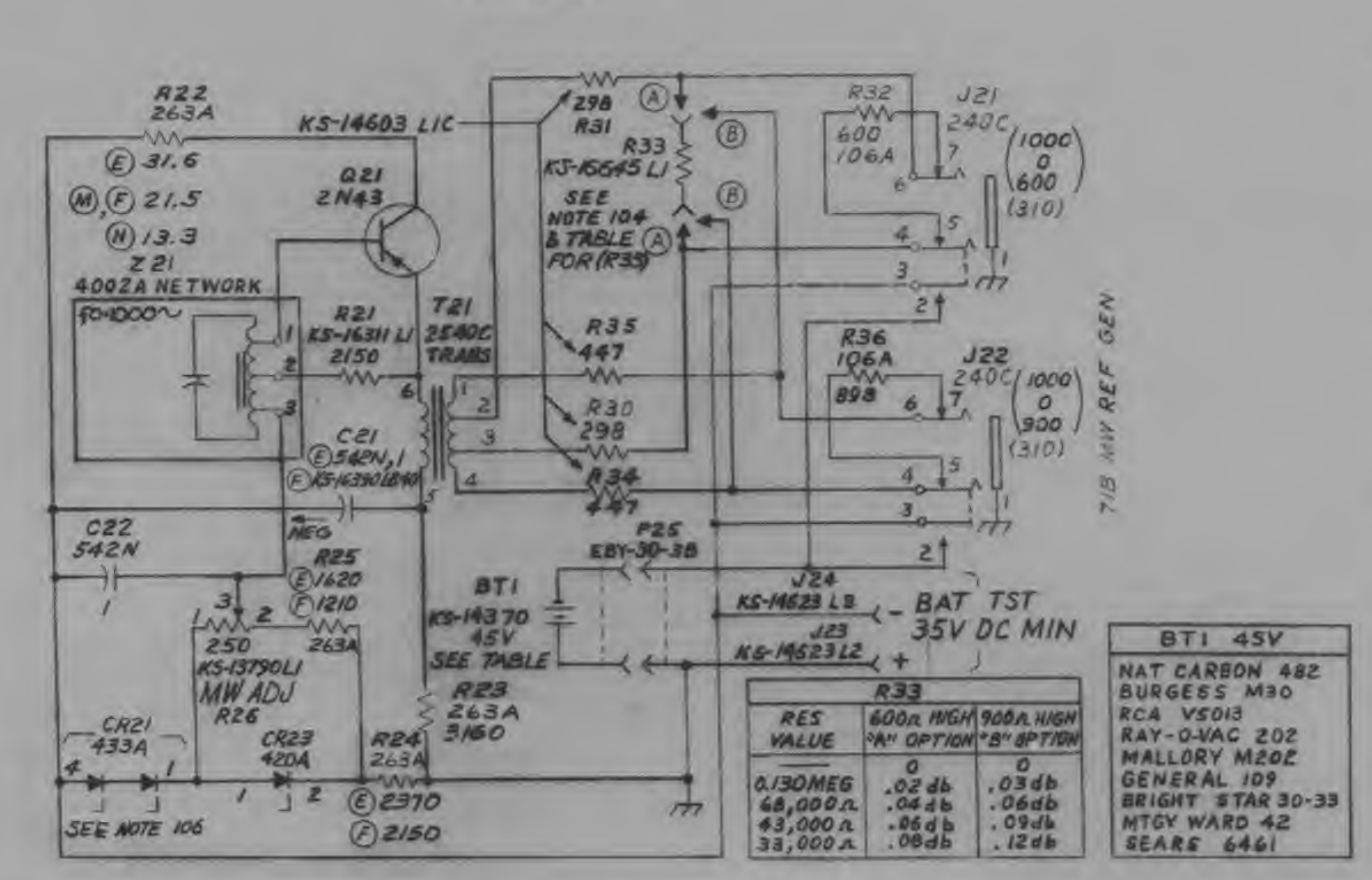


FIG. 2

J94071B L1
PORTABLE UNIT



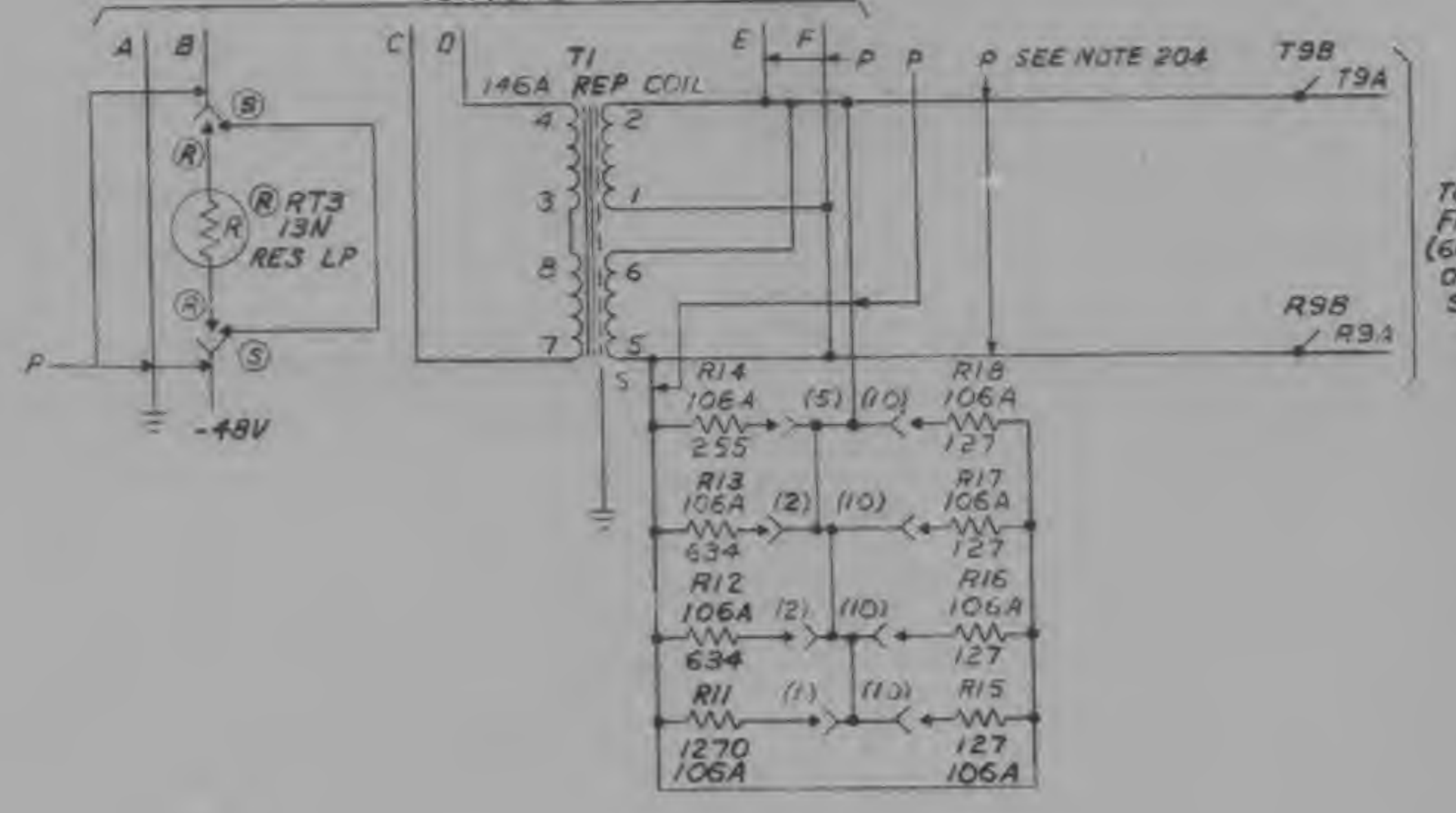
R33		
RES VALUE	600Ω HIGH "A" OPTION	900Ω HIGH "B" OPTION
—	0	0
0.130MEG	.02db	.03db
68,000Ω	.04db	.06db
43,000Ω	.06db	.09db
33,000Ω	.08db	.12db

BT1 45V
NAT CARBON 482
BURGESS M30
RCA VS013
RAY-O-VAC 202
MALLORY M202
GENERAL 109
BRIGHT STAR 30-33
MTGY WARD 42
SEARS 6461

REDUCE TO 3/4

FIG. 9 (MFR DISC.)

BATTERY SUPPLY & LOAD CIRCUIT
J94071C L2,L3 (SEE NOTE 108)
(CAD 3, 4 & 8)



TO NETWORK PER FIGURES 6 AND 7 (600-& 900-OHM OUTLETS) VIA CADS 3,4,& 8 SEE NOTE 113

ARTIFICIAL LOAD STRAPPING: TO DETERMINE RESISTOR STRAPPING CONNECTIONS, SUBTRACT FROM 50 THE NUMBER OF NETWORKS CONNECTED TO THE GENERATOR, THEN CONNECT RESISTORS SO THAT THE TOTAL ARTIFICIAL LOAD, IN EQUIVALENT NETWORKS, IS EQUAL TO THE NUMBER OBTAINED BY SUBTRACTION. THE EQUIVALENT NETWORK LOAD OF EACH RESISTOR IS GIVEN BY THE NUMBER IN ( ) ON THE CIRCUIT. FOR EXAMPLE, SUPPOSE THE ACTUAL LOAD IS 35 NETWORKS (EITHER 600 OR 900 OHM) THEN 50 LESS 35 IS 15 AND THE EQUIVALENT OF 15 NETWORKS IS CONNECTED: I.E., R15 (10) AND R14(5) ARE CONNECTED.

DRAWING ISSUE	
1	EWB
2A	NJS
3D	RJ
4D	AA
5D	EWB
6D	ARN
7A	JJM
8D	JJM
9A	JJM
10B	JJM
11B	AA MGJ
12B	JF AEZ IEB
13B	SS BJG WFO

ISSUE 14B

MILLIWATT DISTRIBUTING CKT ②

BELL TELEPHONE LABORATORIES
INCORPORATED

DWG SIZE 6S

SD-95277-01-2

PRINTED IN U. S. A.

SD-95277-01-2

FIG. 4 (MFR DISC)
900Ω NON-ADJUSTABLE DISTRIBUTING NETWORK SEE NOTE 105

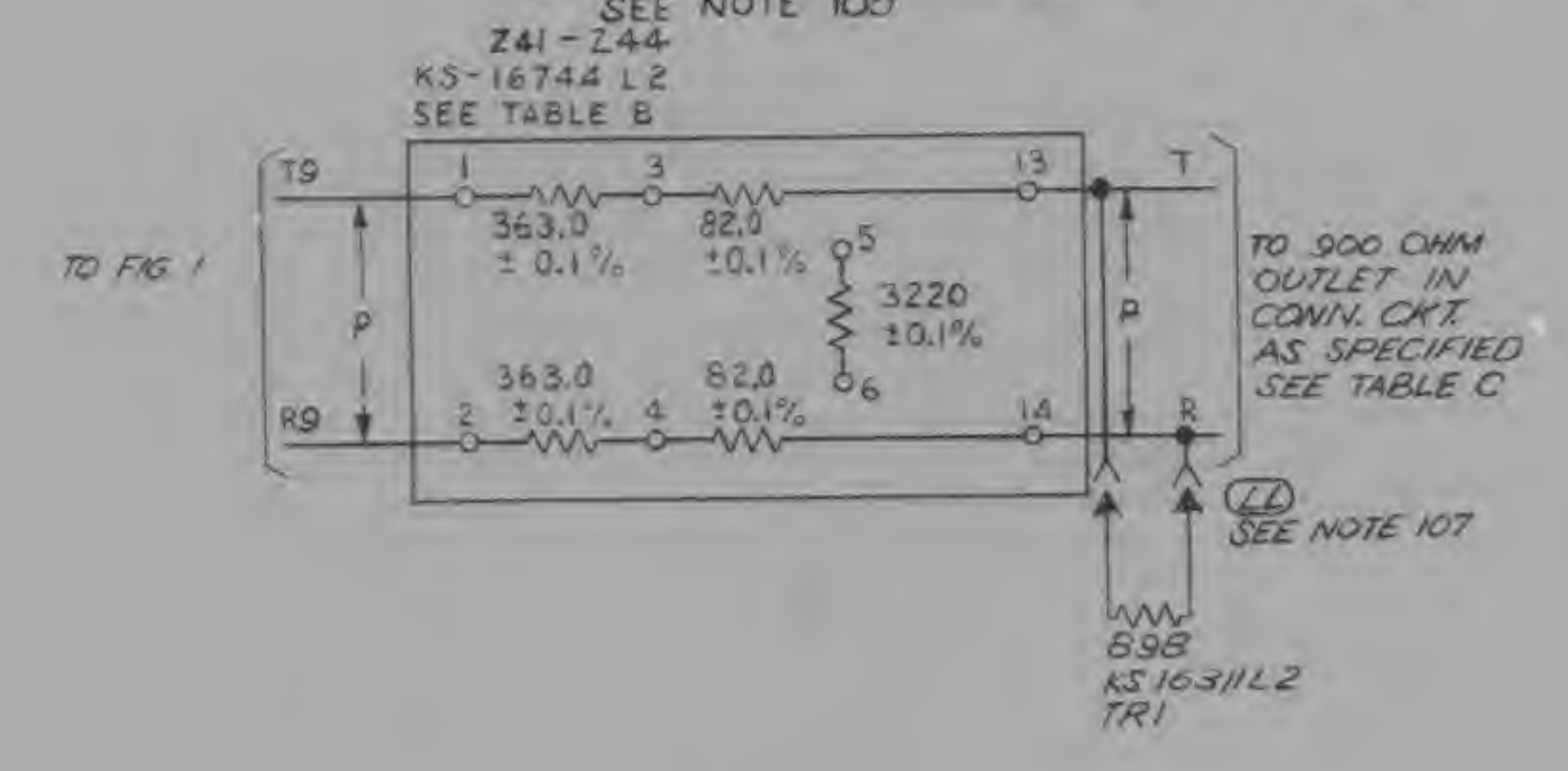


FIG 5 (MFR. DISC)
600Ω NON-ADJUSTABLE DISTRIBUTING NETWORK SEE NOTE 105

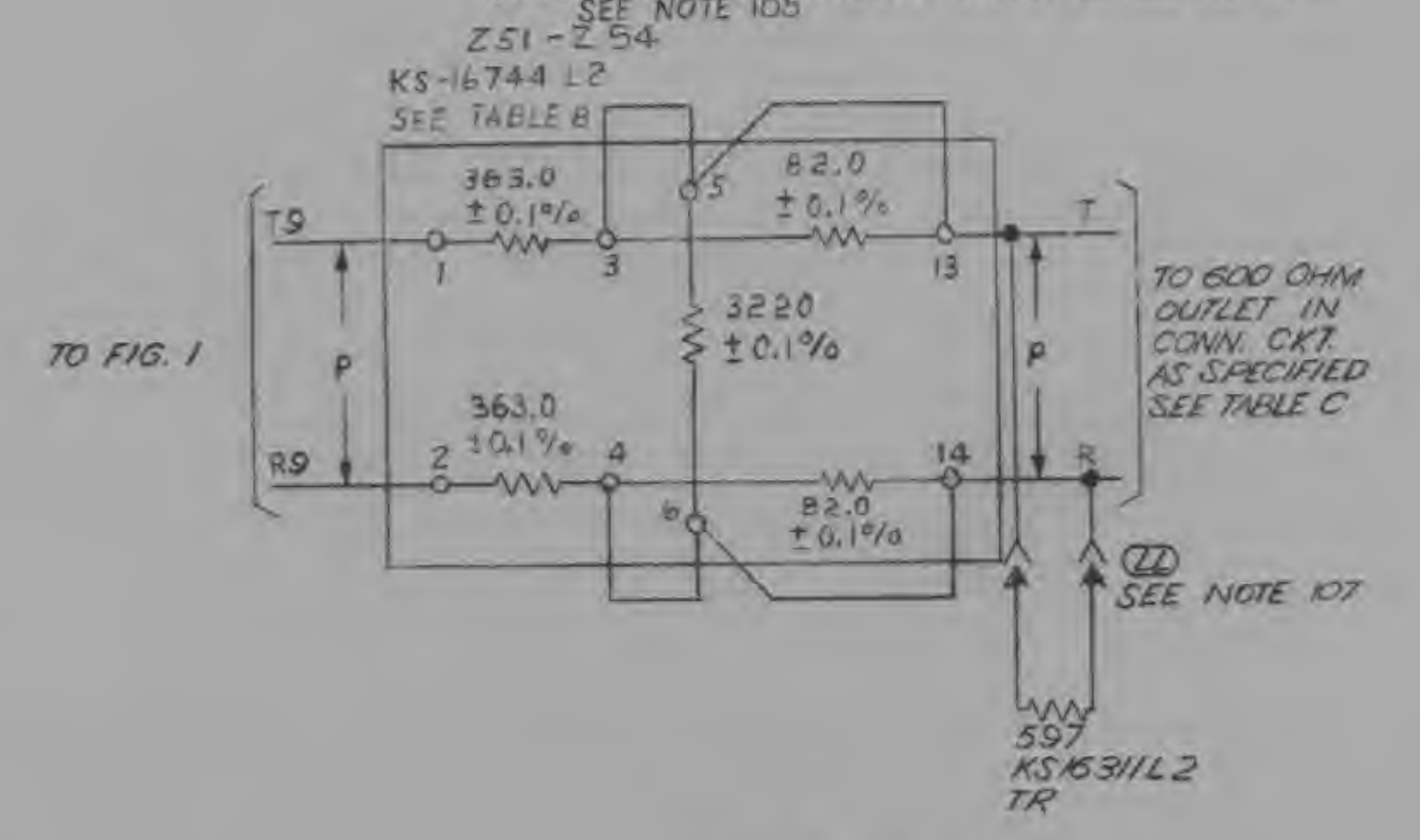


FIG. 6 (MFR DISC)
900Ω ADJUSTABLE DISTRIBUTING NETWORK SEE NOTE 114

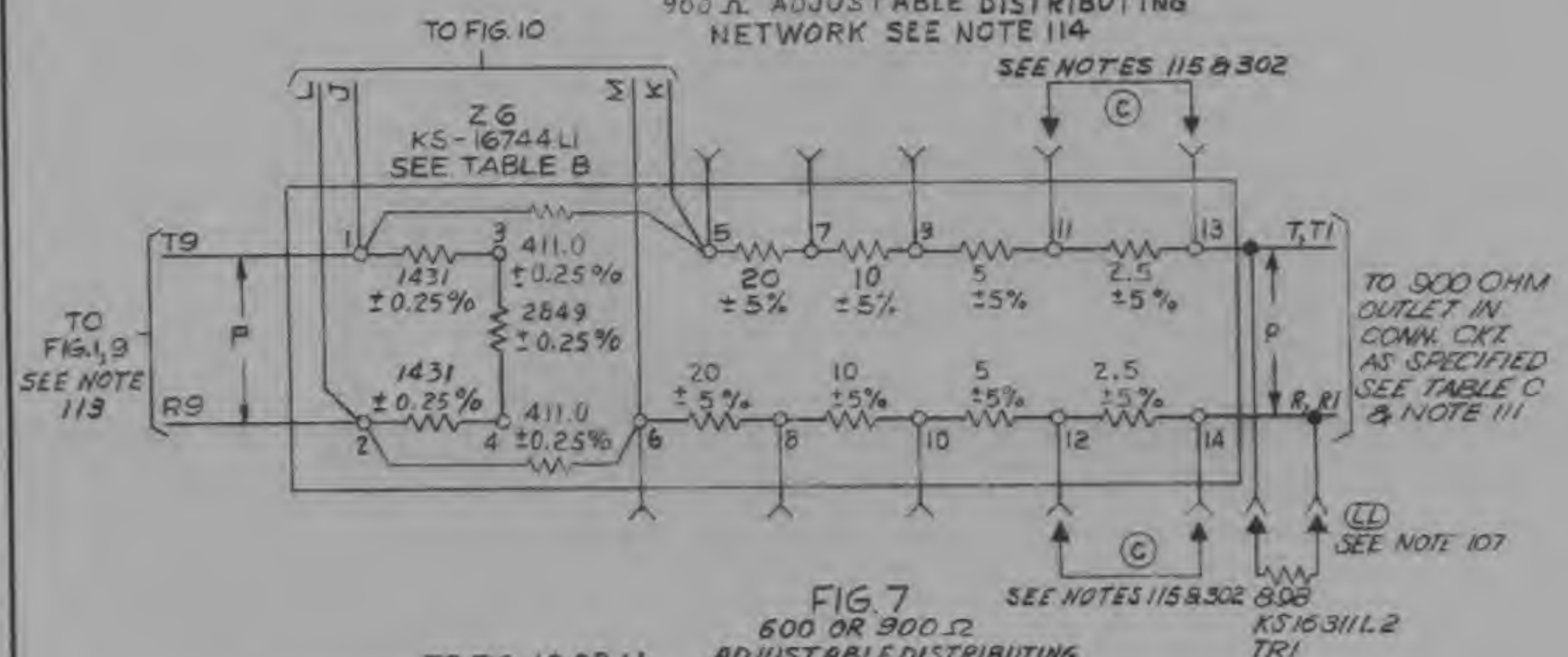


FIG. 7
600 OR 900Ω
ADJUSTABLE DISTRIBUTING NETWORK SEE NOTE 114

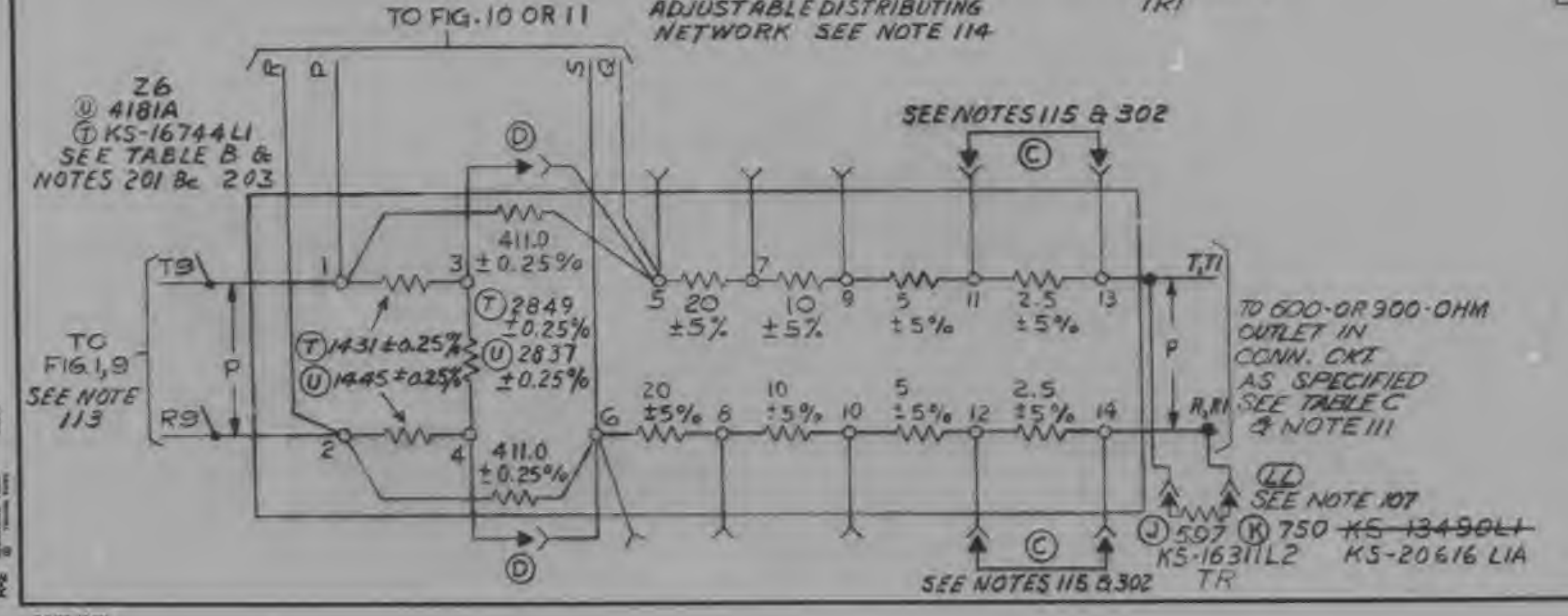


FIG. 101
7IA SIMPLIFIED CKT ARRANGEMENT

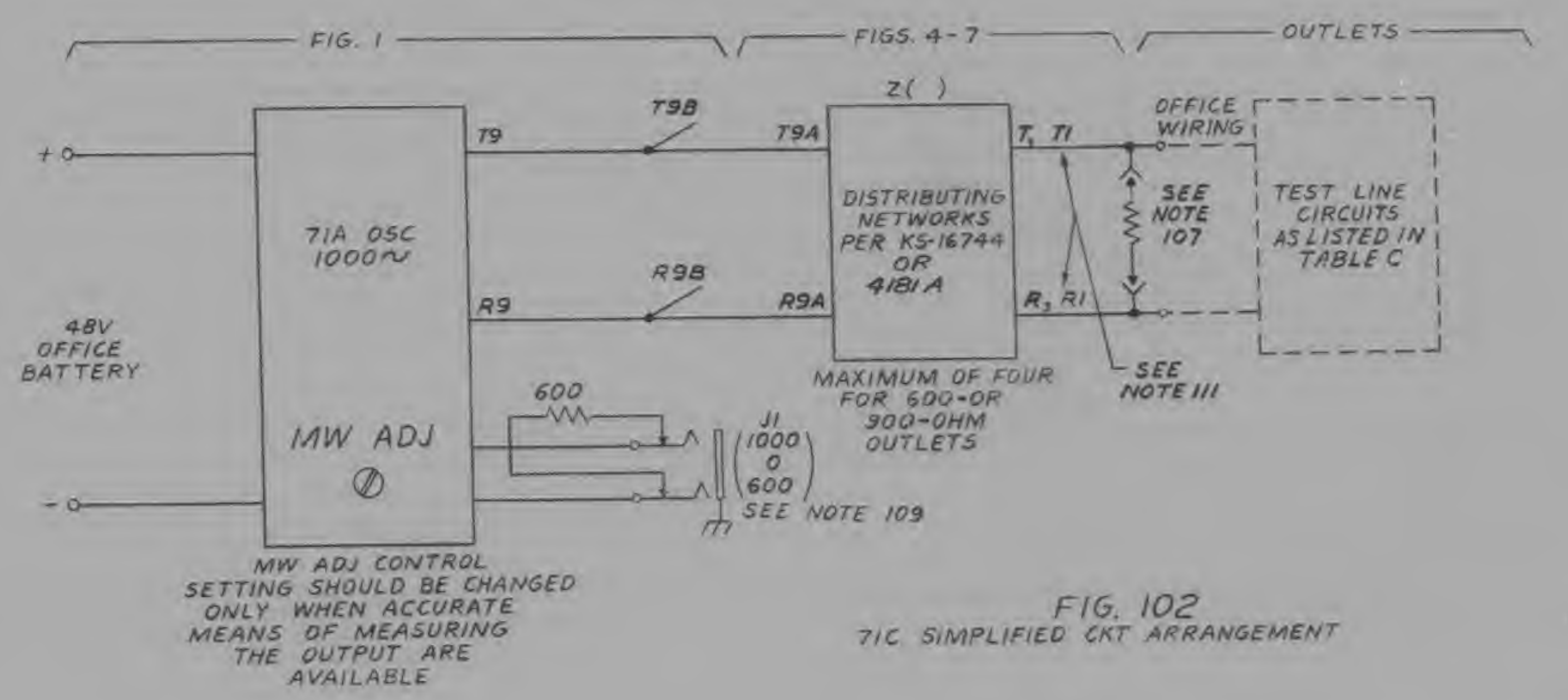


FIG. 1
FIGS. 4-7
OUTLETS
+
-
48V OFFICE BATTERY
71A OSC 1000~
MW ADJ
T9
R9
T9B
R9B
T9A
R9A
Z( )
DISTRIBUTING NETWORKS PER KS-16744 OR 4181A
T, T1
R, R1
OFFICE WIRING
SEE NOTE 107
TEST LINE CIRCUITS AS LISTED IN TABLE C
SEE NOTE 111
MAXIMUM OF FOUR FOR 600-OR 900-OHM OUTLETS
600
J1 (1000 0 600)
SEE NOTE 109
MW ADJ CONTROL SETTING SHOULD BE CHANGED ONLY WHEN ACCURATE MEANS OF MEASURING THE OUTPUT ARE AVAILABLE

FIG. 102
7IC SIMPLIFIED CKT ARRANGEMENT

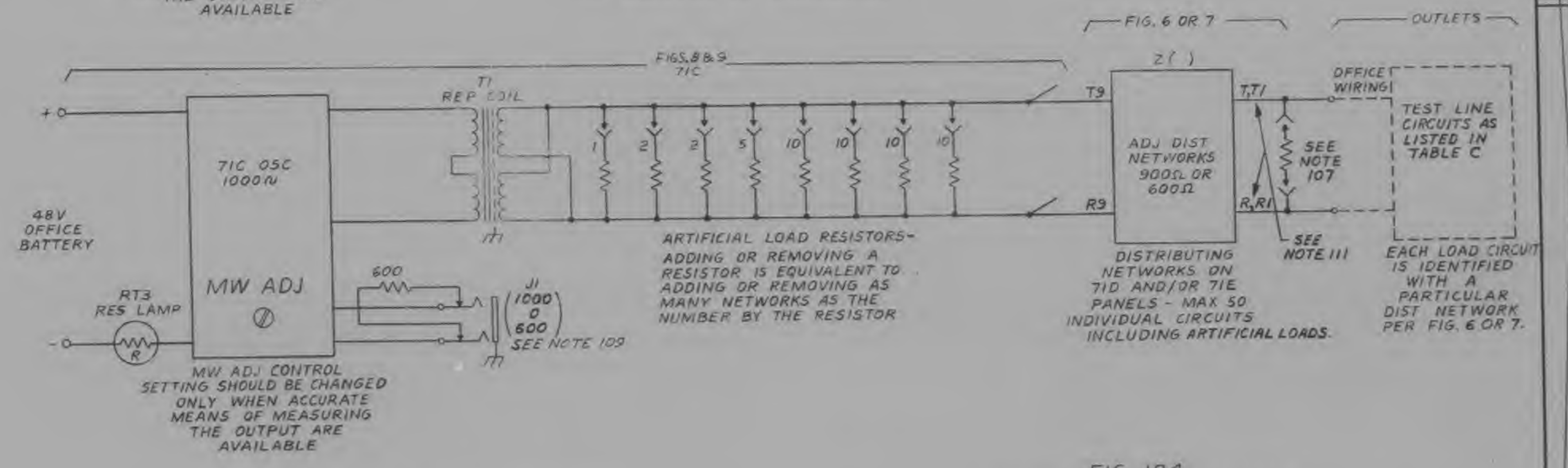

FIGS. 8 & 9 71C
FIG. 6 OR 7
OUTLETS
+
-
48V OFFICE BATTERY
71C OSC 1000~
MW ADJ
RT3 RES LAMP
R
T1 REP COIL
1
2
2
5
10
10
10
10
ARTIFICIAL LOAD RESISTORS- ADDING OR REMOVING A RESISTOR IS EQUIVALENT TO ADDING OR REMOVING AS MANY NETWORKS AS THE NUMBER BY THE RESISTOR
T9
R9
Z( )
ADJ DIST NETWORKS 900Ω OR 600Ω
T,T1
R,R1
SEE NOTE 107
SEE NOTE 111
OFFICE WIRING
TEST LINE CIRCUITS AS LISTED IN TABLE C
DISTRIBUTING NETWORKS ON 71D AND/OR 71E PANELS - MAX 50 INDIVIDUAL CIRCUITS INCLUDING ARTIFICIAL LOADS.
EACH LOAD CIRCUIT IS IDENTIFIED WITH A PARTICULAR DIST NETWORK PER FIG. 6 OR 7.
600
J1 (1000 0 600)
SEE NOTE 109
MW ADJ CONTROL SETTING SHOULD BE CHANGED ONLY WHEN ACCURATE MEANS OF MEASURING THE OUTPUT ARE AVAILABLE

FIG 103
71A MW SYSTEM BLOCK DIAGRAM

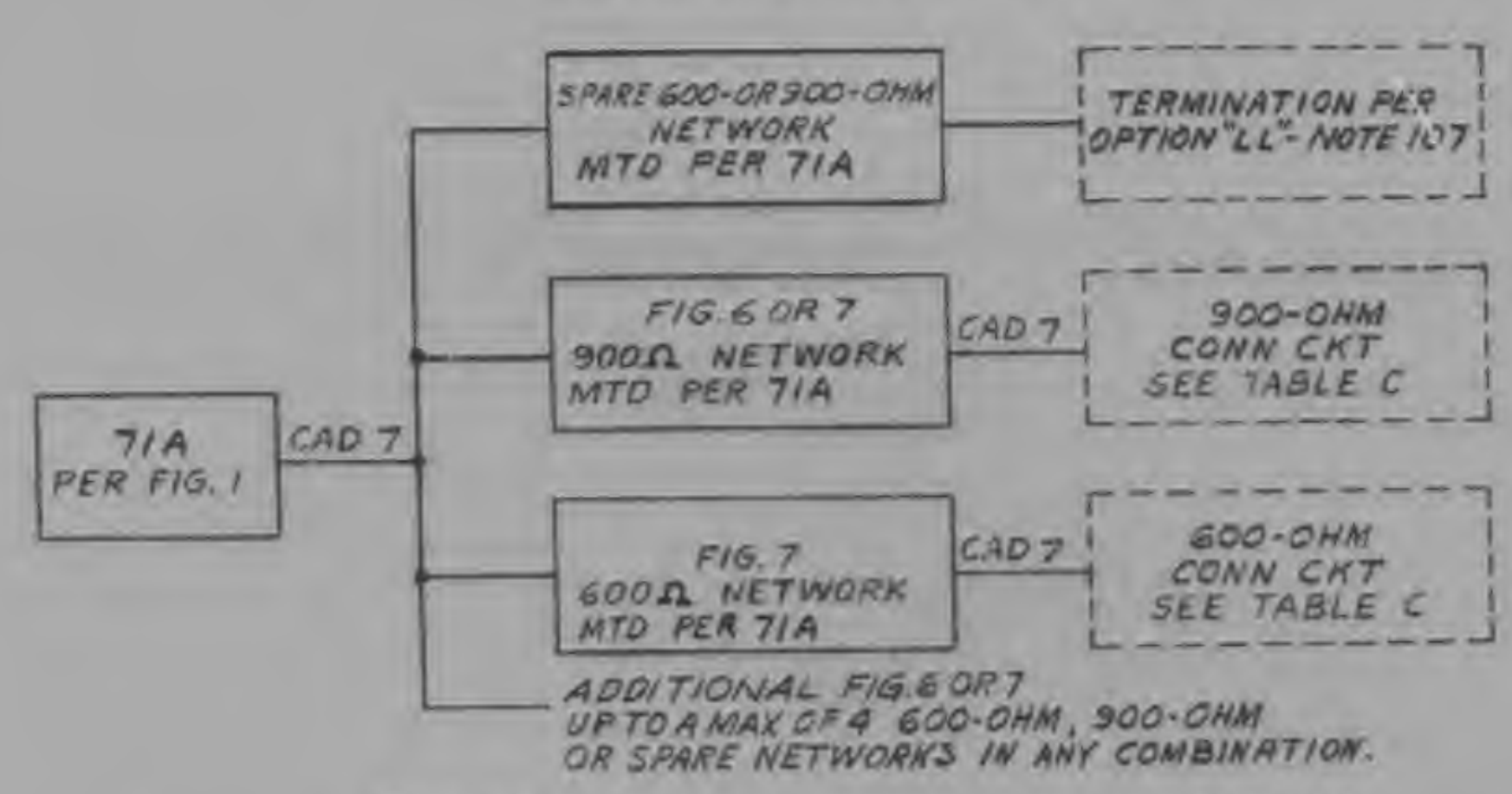

71A PER FIG. 1
CAD 7
SPARE 600-OR 900-OHM NETWORK MTD PER 71A
TERMINATION PER OPTION "LL"- NOTE 107
FIG. 6 OR 7 900Ω NETWORK MTD PER 71A
CAD 7
900-OHM CONN CKT SEE TABLE C
FIG. 7 600Ω NETWORK MTD PER 71A
CAD 7
600-OHM CONN CKT SEE TABLE C
ADDITIONAL FIG. 6 OR 7 UP TO A MAX OF 4 600-OHM, 900-OHM OR SPARE NETWORKS IN ANY COMBINATION.

FIG. 104
71C MW SYSTEM BLOCK DIAGRAM

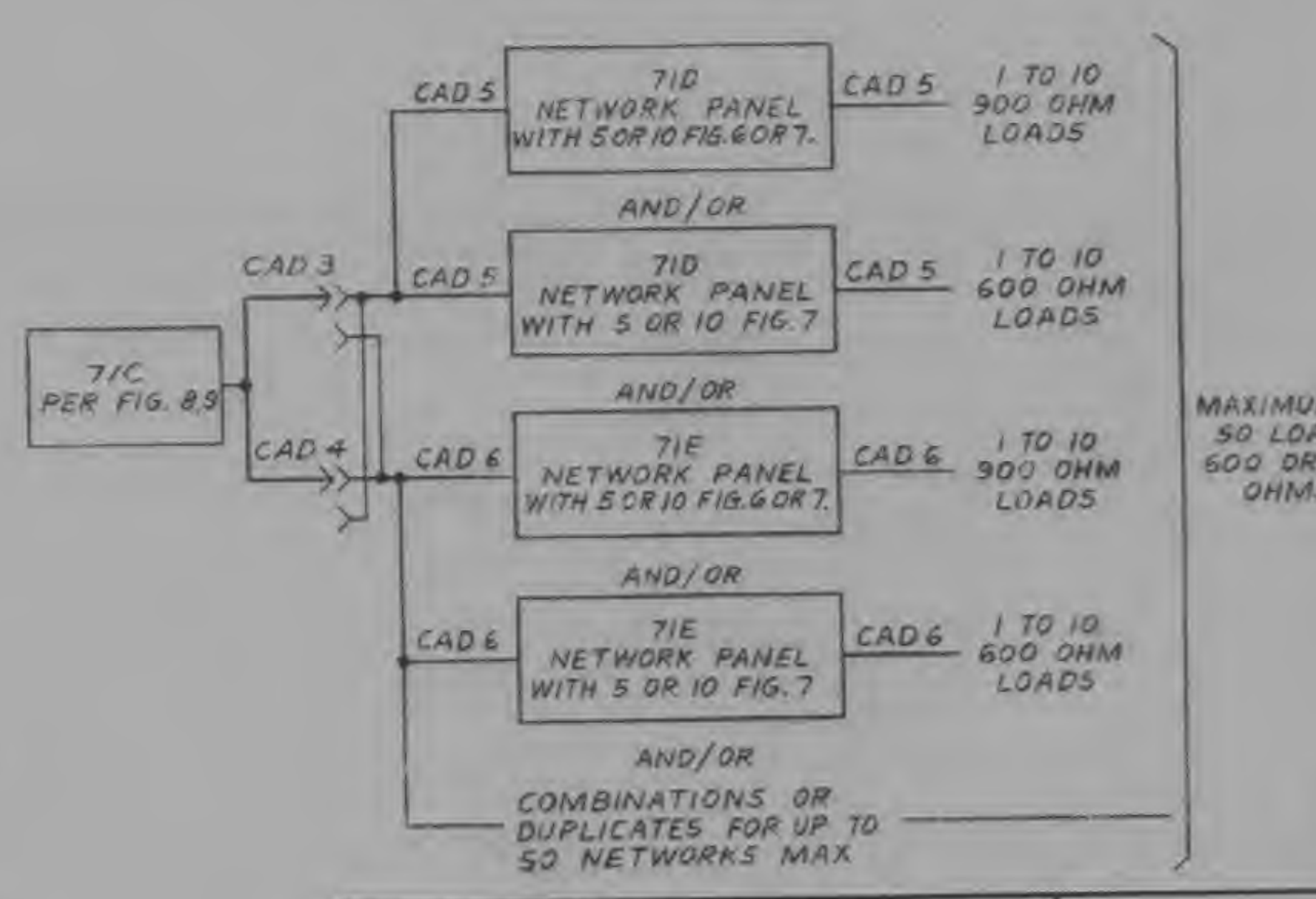

71C PER FIG. 8,9
CAD 3
CAD 4
CAD 5
71D NETWORK PANEL WITH 5 OR 10 FIG. 6 OR 7.
CAD 5
1 TO 10 900 OHM LOADS
AND/OR
CAD 5
71D NETWORK PANEL WITH 5 OR 10 FIG. 7
CAD 5
1 TO 10 600 OHM LOADS
AND/OR
CAD 6
71E NETWORK PANEL WITH 5 OR 10 FIG. 6 OR 7.
CAD 6
1 TO 10 900 OHM LOADS
AND/OR
CAD 6
71E NETWORK PANEL WITH 5 OR 10 FIG. 7
CAD 6
1 TO 10 600 OHM LOADS
AND/OR
COMBINATIONS OR DUPLICATES FOR UP TO 50 NETWORKS MAX
MAXIMUM OF 50 LOADS 600 OR 900 OHMS

FIG. 10
TO OBTAIN 0.5 dbm INTO 900 OHMS FROM TERMINALS 13 & 14 OF FIG. 6 OR 7.
SEE NOTE 111

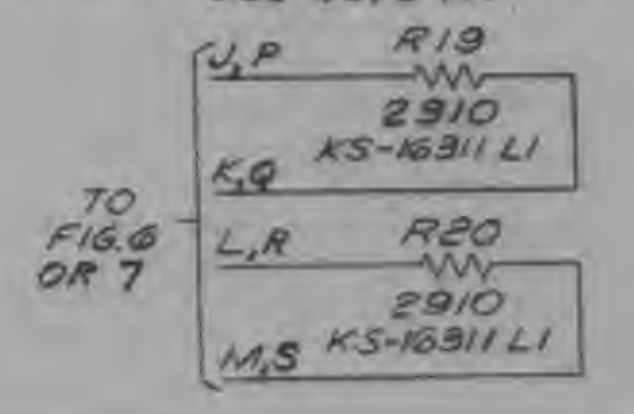
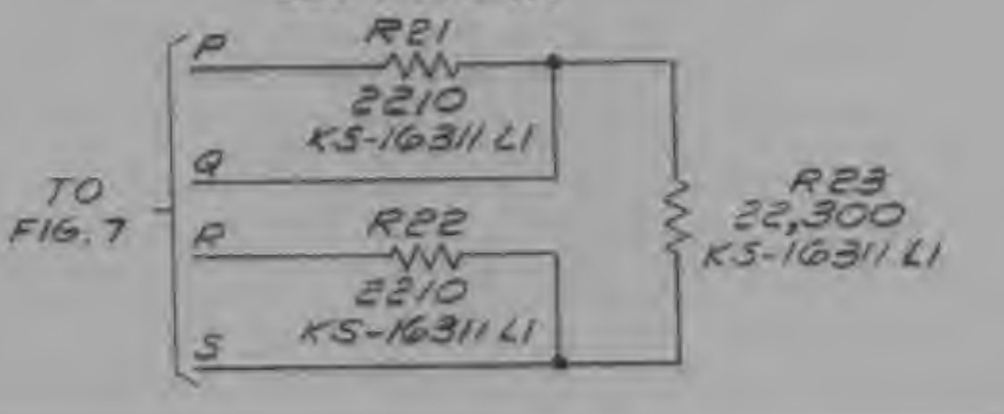


FIG. 11
TO OBTAIN +0.5 dbm INTO 600 OHMS FROM TERMINALS 13 & 14 OF FIG. 7.
SEE NOTE 111



DRAWING ISSUE
1
2A
3D
4D
5D
6D
7A
8D
9A
10B
11B
12B
13B

ISSUE
14B

MILLIWATT DISTRIBUTING CKT

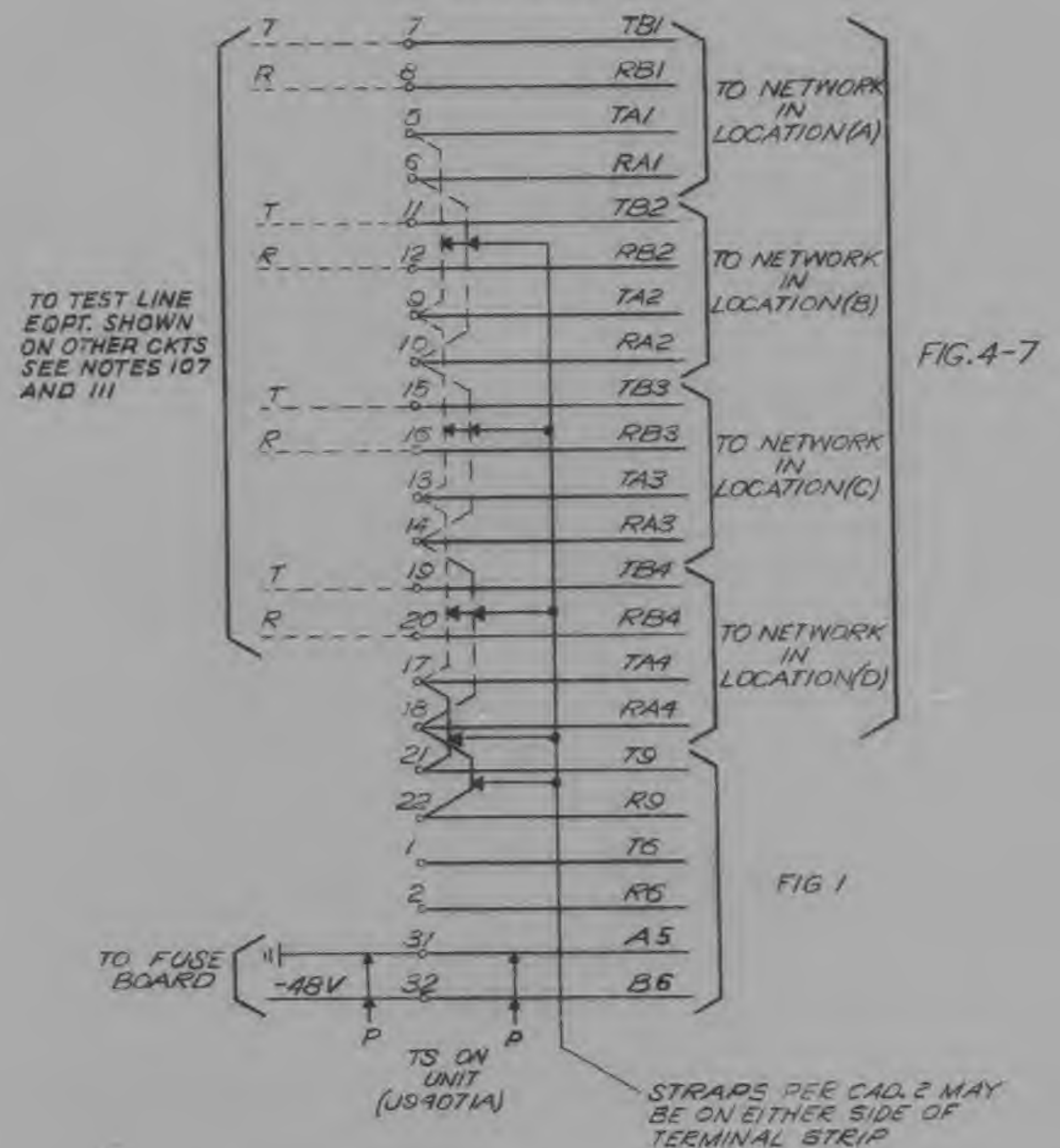
BELL TELEPHONE LABORATORIES
INCORPORATED

DWG SIZE 6S

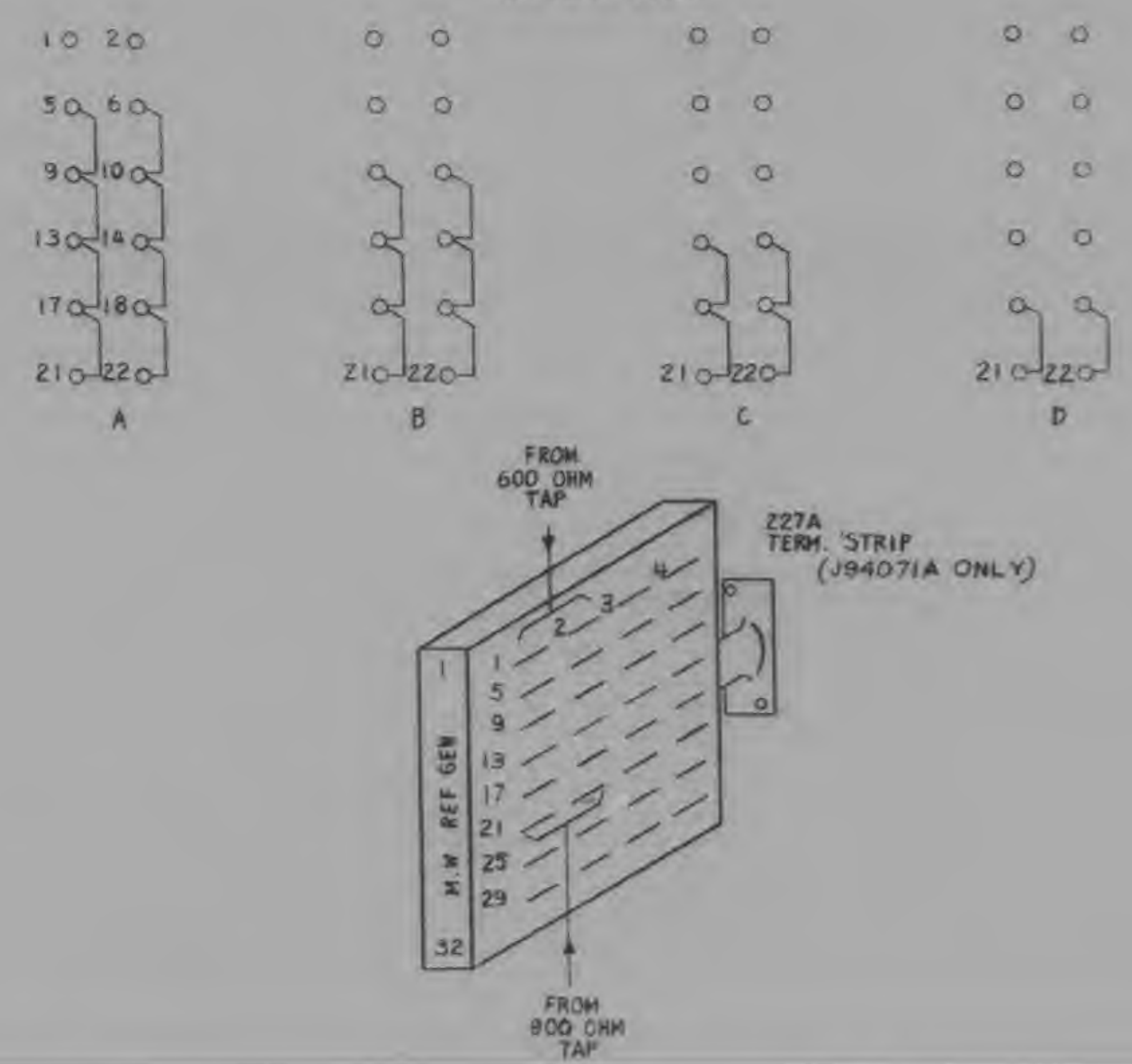
SD-95277-01-3

SD-95277-01-4

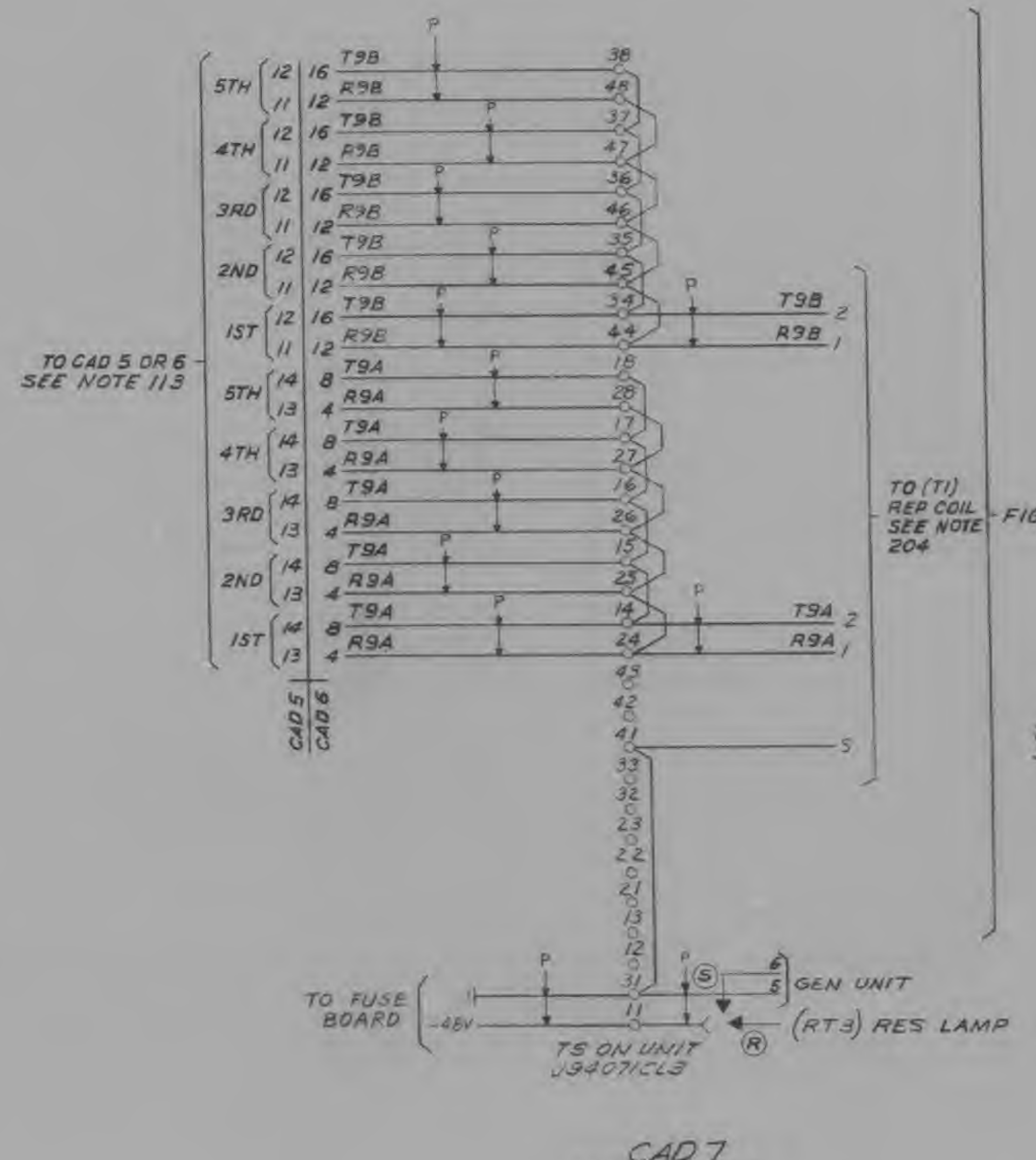
CAD.1 (MFR DISC.)
(FOR FIGS. 1,4,5,6,&7)
SEE NOTE 102 &205


T
R
TO TEST LINE EQPT. SHOWN ON OTHER CKTS SEE NOTES 107 AND 111
7
8
5
6
11
12
9
10
15
16
13
14
19
20
17
18
21
22
1
2
31
32
TB1
RB1
TA1
RA1
TB2
RB2
TA2
RA2
TB3
RB3
TA3
RA3
TB4
RB4
TA4
RA4
T9
R9
T6
R6
A5
B6
TO NETWORK IN LOCATION(A)
TO NETWORK IN LOCATION(B)
TO NETWORK IN LOCATION(C)
TO NETWORK IN LOCATION(D)
FIG.4-7
FIG 1
TO FUSE BOARD
-48V
P
TS ON UNIT (J94071A)
STRAPS PER CAD.2 MAY BE ON EITHER SIDE OF TERMINAL STRIP

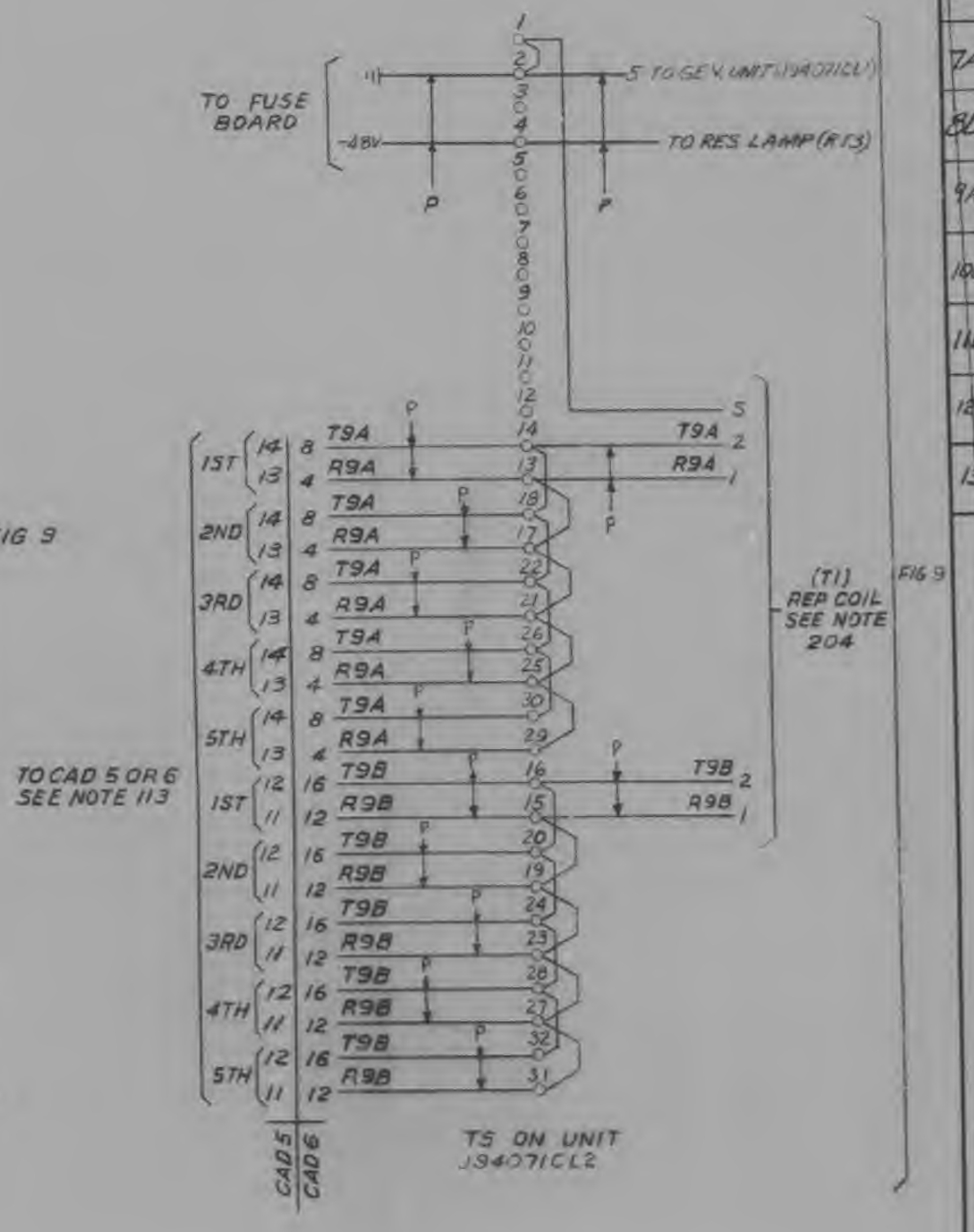
CAD.2 (MFR DISC)
(FOR CAD 1)
TERMINAL BLOCK STRAPPING
FOR DISTRIBUTING NETWORKS
SEE TABLES A & B
(J94071A ONLY)
SEE NOTE 205



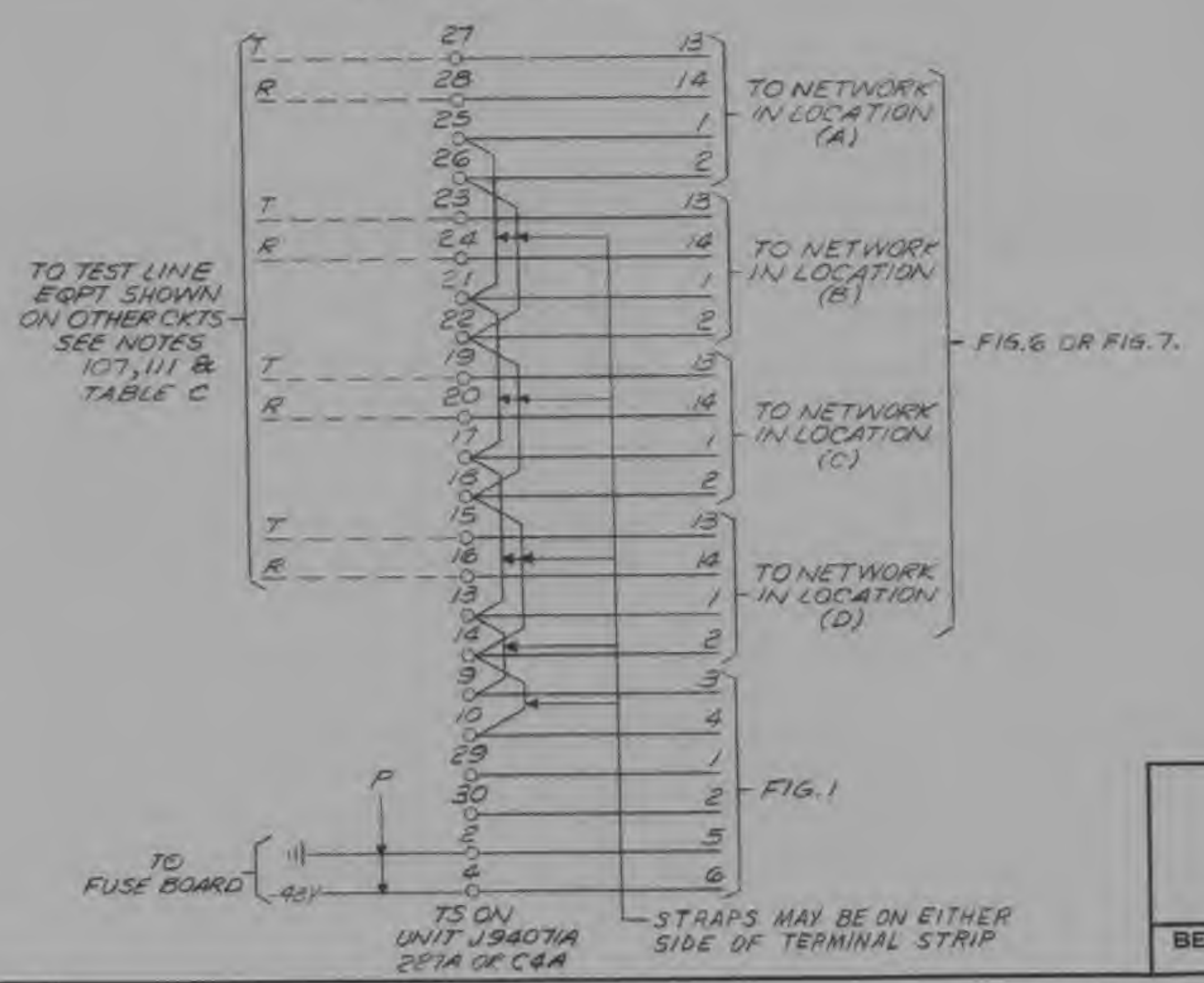
CAD 3 (MFR DISC.)
FOR FIG. 9



CAD 4 (MFR DISC.)
FOR FIG. 9



CAD 7
FOR FIGS 1,6&7
SEE NOTES 102&205


T
R
TO TEST LINE EQPT SHOWN ON OTHER CKTS SEE NOTES 107,111 & TABLE C
27
28
25
26
23
24
21
22
19
20
17
18
15
16
13
14
9
10
29
30
2
4
13
14
1
2
3
4
5
6
TO NETWORK IN LOCATION (A)
TO NETWORK IN LOCATION (B)
TO NETWORK IN LOCATION (C)
TO NETWORK IN LOCATION (D)
FIG.6 OR FIG.7.
FIG.1
P
TO FUSE BOARD
-48V
TS ON UNIT J94071A 227A OR C4A
STRAPS MAY BE ON EITHER SIDE OF TERMINAL STRIP

DRAWING ISSUE
3D
4D
5D
6D
7A
8D
9A
10B
11B
12B
13B

ISSUE
14B

MILLIWATT DISTRIBUTING CKT
②

BELL TELEPHONE LABORATORIES
INCORPORATED

DWG SIZE
6S

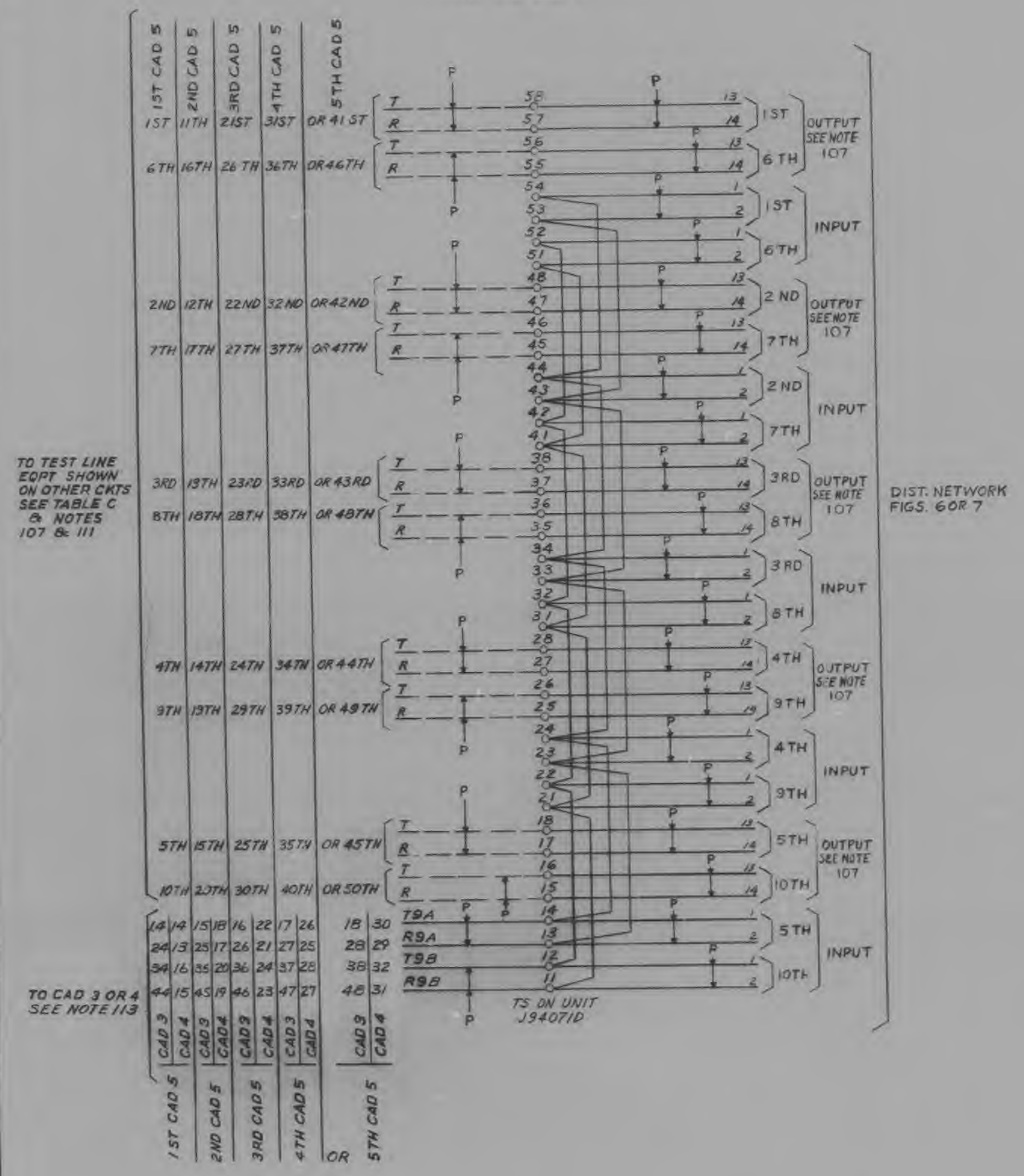
SD-95277-01-4

PRINTED IN U.S.A.

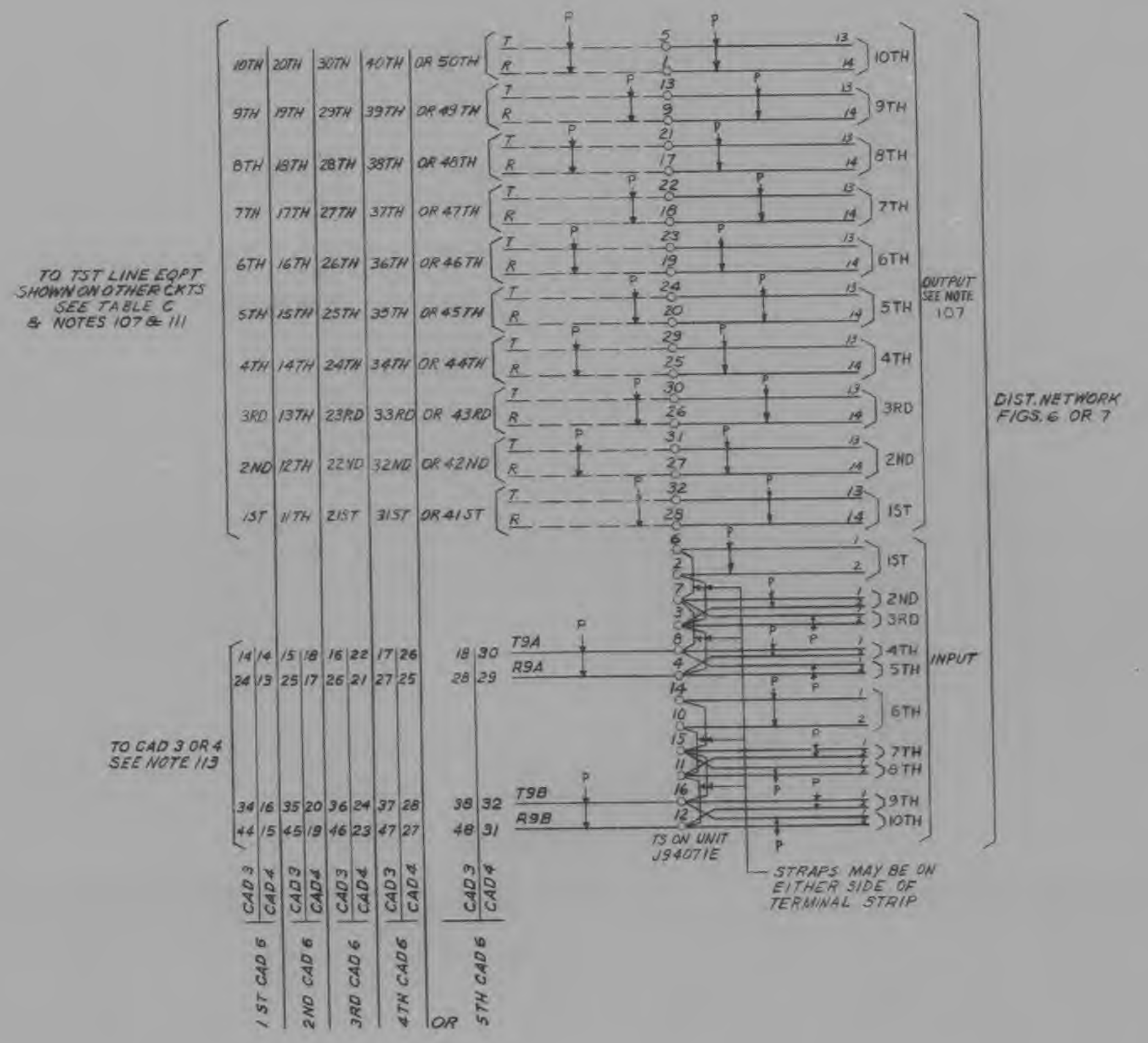
⑥

DRAWING ISSUE
4D
5D
6D
7A
8D
9A
10B
11B
12B
13B

CAD 5
J94071D NETWORK PANEL
FOR FIG. 6 OR 7


1ST CAD 5
2ND CAD 5
3RD CAD 5
4TH CAD 5
5TH CAD 5
1ST 11TH 21ST 31ST OR 41ST
6TH 16TH 26TH 36TH OR 46TH
2ND 12TH 22ND 32ND OR 42ND
7TH 17TH 27TH 37TH OR 47TH
3RD 13TH 23RD 33RD OR 43RD
8TH 18TH 28TH 38TH OR 48TH
4TH 14TH 24TH 34TH OR 44TH
9TH 19TH 29TH 39TH OR 49TH
5TH 15TH 25TH 35TH OR 45TH
10TH 20TH 30TH 40TH OR 50TH
T
R
P
T9A
R9A
T9B
R9B
TO TEST LINE EQPT SHOWN ON OTHER CKTS SEE TABLE C & NOTES 107 & 111
TO CAD 3 OR 4 SEE NOTE 113
CAD 3
CAD 4
OR
OUTPUT SEE NOTE 107
INPUT
DIST. NETWORK FIGS. 6 OR 7
TS ON UNIT J94071D

CAD. 6
(J94071E NETWORK PANEL)
FOR FIG. 6 OR 7


10TH 20TH 30TH 40TH OR 50TH
9TH 19TH 29TH 39TH OR 49TH
8TH 18TH 28TH 38TH OR 48TH
7TH 17TH 27TH 37TH OR 47TH
6TH 16TH 26TH 36TH OR 46TH
5TH 15TH 25TH 35TH OR 45TH
4TH 14TH 24TH 34TH OR 44TH
3RD 13TH 23RD 33RD OR 43RD
2ND 12TH 22ND 32ND OR 42ND
1ST 11TH 21ST 31ST OR 41ST
T
R
P
T9A
R9A
T9B
R9B
TO TST LINE EQPT SHOWN ON OTHER CKTS SEE TABLE C & NOTES 107 & 111
TO CAD 3 OR 4 SEE NOTE 113
CAD 3
CAD 4
1ST CAD 6
2ND CAD 6
3RD CAD 6
4TH CAD 6
OR
5TH CAD 6
OUTPUT SEE NOTE 107
INPUT
DIST. NETWORK FIGS. 6 OR 7
TS ON UNIT J94071E
STRAPS MAY BE ON EITHER SIDE OF TERMINAL STRIP

ISSUE
14B

MILLIWATT DISTRIBUTING CKT

BELL TELEPHONE LABORATORIES
INCORPORATED

6S

SD-95277-01-5

TABLE A (MFR DISC)
(REPLACED BY TABLE D)
(J94071A ONLY)

NO. OF OUTLETS EQUIPPED	NO. OF FIGURES SEE NOTE 1 ~~FIG.4~~ ~~FIG.5~~ FIG.6 FIG.7	SKETCH SHOWING APPARATUS TERMINALS & WIRING LOCATION SEE NOTE 201 (A)	(B)	(C)	(D)	USE TERM. BLOCK STRAPPING PER CAD.2
4	4000	4A	4A	4A	4A	A
	3100				5A	
	3010				6A	
	3001				7A	
	2200			5A	5A	
	2110				6A	
	2101				7A	
	2020			6A	6A	
	2011				7A	
	2002			7A		
	1300		5A	5A	5A	
	1210				6A	
	1201				7A	
	1120			6A	6A	
	1111				7A	
	1102			7A		
	1030		6A	6A	6A	
	1021				7A	
	1012			7A		
	1003		7A			
	0400	5A	5A	5A	5A	
	0310				6A	
	0301				7A	
	0220			6A	6A	
	0211				7A	
	0202			7A		
	0130		6A	6A	6A	
	0121				7A	
	0112			7A		
	0103		7A			
4	0040	6A	6A	6A	6A	A
	0031				7A	
	0022			7A		
	0013		7A			
	0004	7A				

NO. OF OUTLETS EQUIPPED	NO. OF FIGURES SEE NOTE 1 ~~FIG.4~~ ~~FIG.5~~ FIG.6 FIG.7	SKETCH SHOWING APPARATUS TERMINALS & WIRING LOCATION SEE NOTES 2 & 201 (A)	(B)	(C)	(D)	USE TERM. BLOCK STRAPPING PER CAD.2
3	3000	X	4A	4A	4A	B
	2100				5A	
	2010				6A	
	2001				7A	
	1200			5A	5A	
	1110				6A	
	1101				7A	
	1020			6A	6A	
	1011				7A	
	1002			7A		
	0300		5A	5A	5A	
	0210				6A	
	0201				7A	
	0120			6A	6A	
	0111				7A	
	0102			7A		
3	0030	X	6A	6A	6A	B
	0021				7A	
	0012			7A		
	0003		7A			
2	2000			4A	4A	C
	1100				5A	
	1010				6A	
	1001				7A	
	0200			5A	5A	
	0110				6A	
	0101				7A	
2	0020	X	X	6A	6A	C
	0011				7A	
	0002			7A		
1	1000			X	4A	D
	0100				5A	
1	0010	X	X	X	6A	D
	0001				7A	
NONE	0000				X	NONE

NOTES:

1. ~~FIRST DIGIT (LEFT HAND) IS THE NUMBER OF NON ADJUSTABLE 900Ω NETWORKS (FIG.4) INSTALLED. SECOND DIGIT IS THE NUMBER OF NON-ADJUSTABLE 600Ω NETWORKS (FIG.5) INSTALLED~~. THIRD DIGIT IS THE NUMBER OF ADJUSTABLE 900Ω NETWORKS (FIG.6) INSTALLED. FOURTH DIGIT IS THE NUMBER OF ADJUSTABLE 600Ω NETWORKS (FIG.7) INSTALLED.
2. "X" INDICATES UNEQUIPPED POSITION.
3. THE (LL) OPTION SHOWN IN FIGS.4,5,6 AND 7 SHALL BE PROVIDED ON NETWORKS WHICH ARE USED AS SPARES AND NOT SERVING CONNECTING CIRCUITS.

TABLE D (MFR DISC)
(71A ONLY)

NO.OF OUTLETS EQUIPPED	NO.OF FIGURES SEE NOTE 1 ~~FIG.4~~ ~~FIG.5~~ FIG.6 FIG.7	SKETCH SHOWING APPARATUS TERMINALS & WIRING LOCATION SEE NOTES 2,3 & 201 (A)	(B)	(C)	(D)	USE TERM. BLOCK STRAPPING PER CAD.7
4	0 0 0 4	7A	7A	7A	7A	
2	0 0 0 2	X	X	7A	7A	

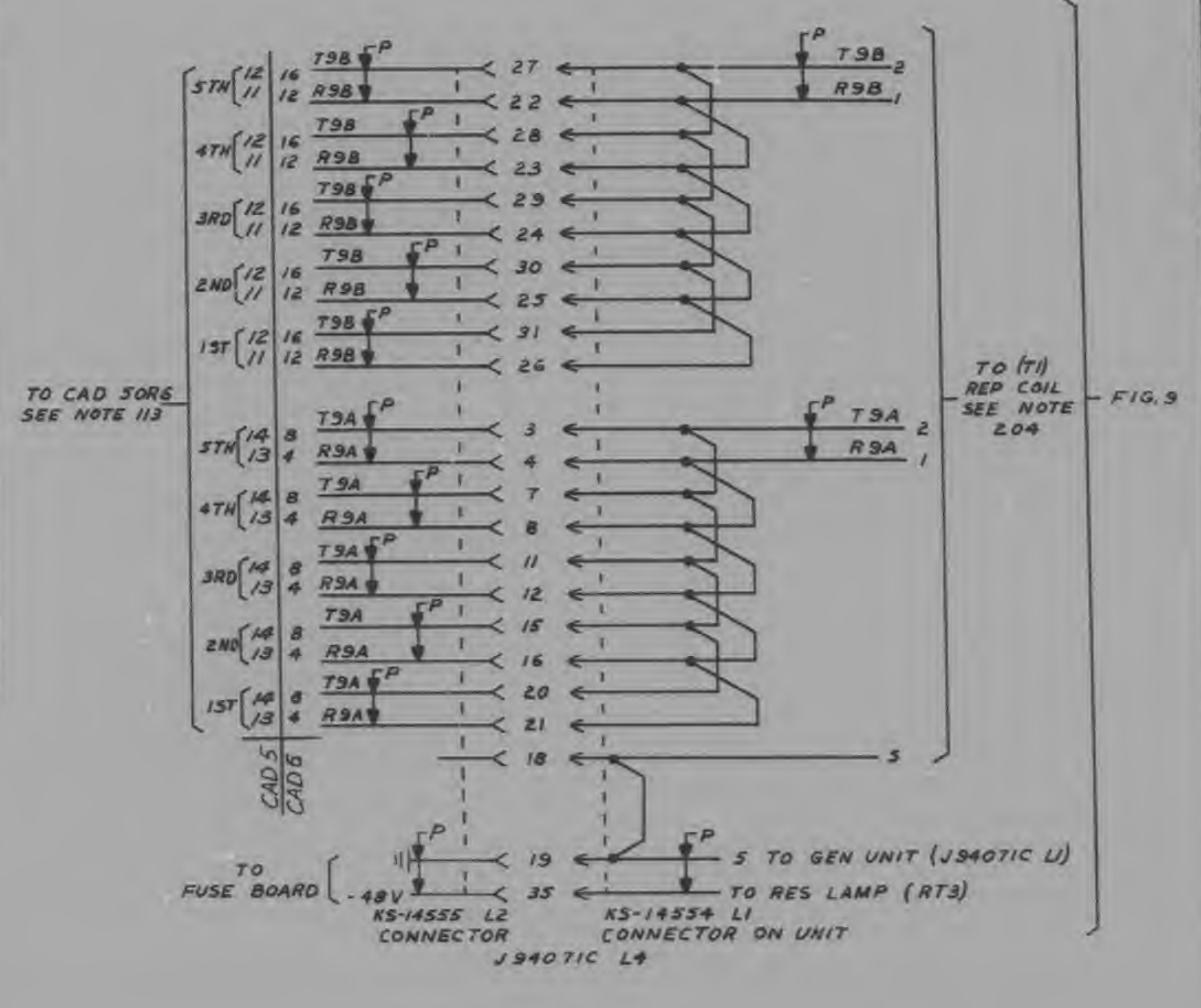
NOTES:

1. UNLESS OTHERWISE STATED ALL POSITIONS ARE INITIALLY EQUIPPED WITH NETWORKS STRAPPED PER SK 7A. WHEN INSTALLED AND ASSIGNED FOR 900 OHM OUTLETS THE STRAPS FROM 3-5 AND 4-6 ON NETWORKS SHALL BE CUT.
2. "X" INDICATES UNEQUIPPED POSITION.
3. "LL" OPTION SHOWN IN FIGS. 6 AND 7 SHALL BE PROVIDED ON NETWORKS WHICH ARE USED AS SPARES AND NOT SERVING CONNECTING CIRCUITS.

TABLE B (MFR DISC)
SEE NOTE 203
(71A ONLY)

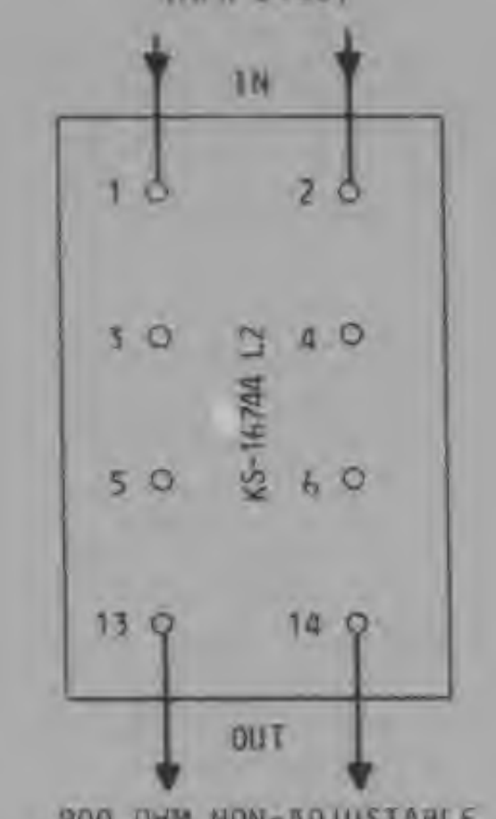
NETWORK FUNCTIONAL DESIGNATIONS				
LOCATION SEE NOTE 201	KS-16744 L2		KS-16744 L1	
	FIG. 4	FIG. 5	FIG. 6	FIG. 7
(A)	Z41	Z51	Z61	Z71
(B)	Z42	Z52	Z62	Z72
(C)	Z43	Z53	Z63	Z73
(D)	Z44	Z54	Z64	Z74

CAD 8 (A &M)
FOR FIG. 9



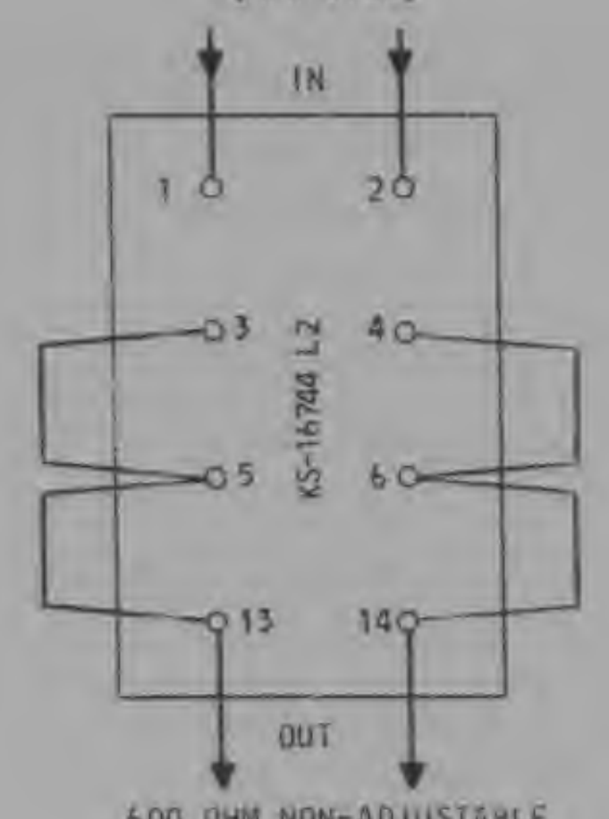
DRAWING ISSUE	
8D	JJM
9A	JJM
10B	JJM
11B	AA REJ
12B	JF AEZ TSB
13B	GS DJG WFG

SK 4A
(MFR DISC)



900 OHM NON-ADJUSTABLE
M.W. OUTLET

SK 5A
(MFR DISC)



600 OHM NON-ADJUSTABLE
M.W. OUTLET

ISSUE
14B

MILLIWATT DISTRIBUTING CKT ②

BELL TELEPHONE LABORATORIES
INCORPORATED

6S

SD-95277-01-6

E. EAGLE

SD-95277-01

DRAWING INDEX TABLE

	71A GENERATOR		71B GENERATOR		71C GENERATOR		71D NETWORK PANEL		71E NETWORK PANEL	
	FIG.	SHEET	FIG.	SHEET	FIG.	SHEET	FIG.	SHEET	FIG.	SHEET
CIRCUIT SCHEMATICS	1	2	2		8,9	2				
SIMPLIFIED CIRCUIT DIAGRAM	101	3			102	3				
MW SYSTEM BLOCK DIAGRAMS	103	3			104	3	104	5	104	3
CABLING DIAGRAMS	CAD. 1,7 CAD. 2	4			CAD. 3,4 CAD. 8	4 6	CAD. 5	5	CAD. 6	5
DISTRIBUTING NETWORKS (ADJUSTABLE)	6,7	3					6,7	3	6,7	3
DISTRIBUTING NETWORK MODIFICATION FOR +0.5 DBM	7,10,11	3					7,10,11	3	7,10,11	3
DISTRIBUTING NETWORKS (NONADJUSTABLE)	4,5	3								
CIRCUIT NOTES EQUIPMENT NOTES INFORMATION NOTES		1				1		1		1
LIST OF CONNECTING CIRCUITS	TABLE C	1			TABLE C	1	TABLE C	1	TABLE C	1
APPARATUS TERMINAL AND WIRING LOCATION TABLES A B, AND D		6								

DWG ISS	CD ISS	DWG ISS	CD ISS	DWG ISS	CD ISS
1	1	2A	2A	3D	3D
4D	4D	5D	4D APP 1D	6D	4D APP 2D
7A	4D APP 3D	8D	5D	9A	5D APP 1D
10B	5D APP 2D				

DWG ISS	CD ISSUE	DATE ISSUED	DRAWN	APPD
11B	6B	10-1-62	TMS RA	PJK BCB MEJ
12B	6B APP 1B	12-22-64	JF AEZ	PJK BCB TEB
13B	6B APP 2B	8-25-66	GS DJG	PJK JJK WFO
14B	6B APP 3B	8-7-72	GRL GWW	PJK TCA MEJ

J94071E ( )
J94071D ( )
J94071C ( )
J94071B ( )
J94071A ( )
EQUIPMENT INFO.

ISSUE
14B

REPLACING SD-95000-01 & SD-95000-02

SD-95277-01 1N20

COMMON SYSTEMS

TRANSMISSION MEASURING
MILLIWATT DISTRIBUTING CKT

USING 71 TYPE MILLIWATT REFERENCE
GENERATOR

(71A, 71B & 71C MW REF GEN)
(71D & 71E NETWORK PANELS)

AT&TCO
STANDARD

SD-95277-01-A
7 SHEETS

BELL TELEPHONE LABORATORIES
INCORPORATED

6S

SD-95277-01-A

SD-95277-02

CIRCUIT NOTES:

101.

DESIG	FUSE AMP	POTENTIAL	ONE PER
A	1-1/3	-48V SIGNAL	MAX ONE PER FIGS. 1 & 2

BATTERY SYMBOL	VOLTAGE RANGE
-48	44-52.5V SIGNAL EMER MIN: 42.75V

71F CURRENT DRAIN: APPROX 85 MA AT 48 VOLTS

102. THE DISTRIBUTING NETWORK IN FIG. 3 IS USED FOR 600- OR 900-OHM APPLICATIONS OR AS A SPARE. A PARTICULAR APPLICATION DETERMINES CONNECTIONS ON THE NETWORK ACCORDING TO OPTIONS D AND LL. REFER TO TABLE B FOR NETWORK OPTIONS.

103. THE C STRAPS ON FIG. 3 ARE CONNECTED ACCORDING TO BSP 103-335-513 TO COMPENSATE FOR OFFICE WIRING AND EQUIPMENT LOSS.

104. EACH NETWORK ON A DISTRIBUTING NETWORK PANEL MAY BE STRAPPED FOR 600 OR 900 OHMS. EACH GROUP OF FIVE NETWORKS MAY BE CONNECTED TO SEPARATE GENERATOR OUTPUT LEVELS (PAIRS T3R3, T4R4, OR T5R5 OF FIG. 2).

105. DESIG (T) AND (R) OF FIG. 3 BECOME (T1) AND (R1) WHEN THE DISTRIBUTING NETWORK PER FIG. 3 IS USED WITH FIG. 5 TO OBTAIN +0.5 DBM AS REQUIRED BY SD-68446-01 AND SD-95698-01 (ISSUE 9 OR LATER); OR WHEN USED WITH FIG. 4 AS REQUIRED BY SD-27727-01 AND SD-32521-01).

106. FIGS 4 AND 5 SHALL BE USED TO OBTAIN +0.5 DBM FROM FIG. 3 ONLY WHEN FIG. 3 IS CONNECTED TO PAIR (T5), (R5) OF FIG. 2, OR TO PAIR (T9), (R9) OF FIG. 9, SD-95277-01.

107. PROVIDE LL OPTION INITIALLY IN FIG. 3, RETAIN WHEN THE DISTRIBUTING NETWORK IS USED AS A SPARE CONNECTED TO THE GENERATOR AND NOT SERVING A CONNECTING CIRCUIT.

108. PAIRS T( ) AND R( ) WHEN CONNECTED TO A DISTRIBUTING NETWORK PER FIG. 3, PROVIDE THE FOLLOWING OUTPUT LEVELS FROM THE NETWORK:

T3, R3,	+7 DBM
T4, R4,	-16 DBM
T5, R5,	0 DBM
T7, R7	-10 DBM

PAIR TR OF FIG. 2 CONNECTED TO TERMINALS 26 & 31, 25 & 30, 24 & 29, 23 & 28, AND 22 & 27 OF CAD1 MAY BE USED TO FEED A COMBINED TOTAL OF FIFTY (50) DISTRIBUTING CIRCUITS OR NETWORKS OF SD-95000-01, OR SD-95000-02. THESE TERMINALS SHALL NOT BE USED TO FEED FIG. 3 OF THIS DRAWING.

109. WHEN A MAXIMUM OF TEN NETWORKS ARE CONNECTED TO PAIR T3R3, PAIRS TR AND T5R5 SHALL NOT FEED A COMBINED TOTAL OF MORE THAN TEN NETWORKS PER FIG. 3 OF THIS DRAWING OR DISTRIBUTING CIRCUITS PER SD-95000-01 AND -02. WHEN A MAXIMUM COMBINED TOTAL OF FIFTY NETWORKS AND DISTRIBUTING CIRCUITS ARE FED BY PAIRS T,R AND T5,R5 NO NETWORKS SHALL BE CONNECTED TO PAIR T3,R3. UP TO FIFTY NETWORKS PER FIG. 3 MAY BE CONNECTED TO PAIR T4,R4 WITHOUT REGARD TO THE NUMBER OF OTHER LEVELS BEING SUPPLIED. SEE NOTE 112

110. THE NUMBER IN PARENTHESIS NEXT TO THE ARTIFICIAL LOAD RESISTORS IS THE NUMBER OF 0 DBM NETWORKS THAT RESISTOR REPRESENTS. THE CONNECTION OF THESE RESISTORS DEPENDS ON THE NUMBER OF +7 AND 0 DBM CIRCUITS CONNECTED TO THE GENERATOR. REFER TO TABLE C FOR APPROPRIATE ARTIFICIAL LOAD RESISTOR CONNECTIONS. REFER ALSO TO NOTE 112.

111. THE WIRE PAIR FOR LEADS E AND F TO FIG. 1 SHALL ORIGINATE AT TRANSFORMER (T1), FIG. 2.

112. PAIR T5,R5 MAY ALSO FEED DISTRIBUTING NETWORKS PER FS 1 OF SD-1C372-01. IN DETERMINING THE ARTIFICIAL LOAD TO BE CONNECTED TO FIG. 2, EACH NETWORK PER FS 1 OF SD-1C372,01 SHOULD BE CONSIDERED AS 1.5 NETWORKS PER FIG. 3 OF THIS DRAWING.

113. IN FIG. 3, U OPTION CONSISTS OF FIVE (5) 4181A NETWORKS WITH FIVE (5) RESISTORS (R25) ASSEMBLED ON PRINTED WIRING BOARD ED-1C551-( ). R OPTION CONSISTS OF FIVE (5) 211A IC'S WITH FIVE (5) RESISTORS (R25) ASSEMBLED ON ANOTHER VINTAGE OF PWB ED-1C551-( ).

EQUIPMENT NOTES:

201. IT IS RECOMMENDED THAT THE GENERATOR AND NETWORK PANELS SHOULD BE MOUNTED AT A CONVENIENT WORKING LEVEL TO FACILITATE INITIAL AND PERIODIC TESTS PER BSP 103-335-300 AND 103-327-500.

202. WHEN THE 71F GENERATOR IS USED TO REPLACE THE 2A SENDING PANEL, IT SHALL BE MOUNTED IN THE SAME SPACE VACATED BY THE 2A PANEL ONLY WHEN THE DISTRIBUTING CIRCUITS HAVE BEEN PRECISELY ADJUSTED AND THE MOUNTING LOCATION IS AT A CONVENIENT WORKING HEIGHT PER NOTE 201. OTHERWISE, REPLACE THESE DISTRIBUTING CIRCUITS WITH 71D OR 71E NETWORK PANELS.

203. DISTRIBUTING NETWORKS PER FIG. 3 ARE MOUNTED AND MULTIPLED IN GROUPS OF FIVE (5) ON 71D AND 71E NETWORK PANELS, WITH A MAXIMUM OF TWO (2) GROUPS PER PANEL. NETWORKS PER FIG. 3 OF THIS DRAWING ARE IDENTICAL TO THOSE OF FIG. 6 AND 7 OF SD-95277-01.

204. NO MORE THAN FIVE (5) DISTRIBUTING NETWORKS PER FIG. 3 SHALL BE FED BY A SINGLE WIRE PAIR BETWEEN THE GENERATOR AND NETWORK PANEL. IN ADDITION, THE LOOP RESISTANCE OF THIS WIRE PAIR SHALL NOT BE MORE THAN 0.5 OHM.

205. PRIOR TO ISSUE 6B, 263A RESISTORS WERE 221A RESISTORS. IN ALL CASES OF REPAIR OR REPLACEMENT WHEN 221A RESISTORS ARE REPLACED, THEY SHALL BE REPLACED WITH 263A RESISTORS.

206. PRIOR TO ISSUE 6B, THE KS-14554L7 CONNECTOR IN CAD 1 WAS SHOWN AS KS-14554L1.

207. EACH T( ) AND R( ) PAIR APPEARANCE ON THE DISTRIBUTION PANEL SHALL CONNECT AS REQUIRED TO ONLY ONE T( ) AND R( ) PAIR APPEARANCE ON A TONE GENERATOR PER CAD 1 OF SD-96618-01.

INFORMATION NOTES:

301. UNLESS OTHERWISE SPECIFIED: RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN MICROFARADS.

302. OFFICE DRAWING RECORD NEED NOT BE MAINTAINED FOR C,D, OR LL OPTIONS ON DISTRIBUTING NETWORKS (NOTE 103). NETWORK CONDITIONING INFO SHALL BE KEPT IN MILLIWATT RECORD BOOK ED-95166. ONE BOOK SHALL CONTAIN RECORDS FOR ONE GENERATOR ONLY.

303. ALL CONNECTING CIRCUITS ON WHICH DC MAY BE PRESENT SHALL BE EQUIPPED WITH BLOCKING CAPACITORS. AN EXCEPTION TO THIS IS THE GROUND CROSS DETECTING CIRCUIT SD-1A231-01.

304. ALL CONNECTING UNITS SHALL BE TERMINATED IN 600 OR 900 OHMS RESISTANCE AT ALL TIMES, SUCH AS A CIRCUIT UNDER TEST, EXCEPT WHEN PROVIDED WITH A SENDING PAD OF 15 DB OR MORE LOSS, OR WHEN CONNECTED TO -16 DBM, OR SD-1C372-01.

305. ALL CONNECTING CIRCUITS USED FOR TESTING WHERE AN OPEN CIRCUIT, A SHORT CIRCUIT OR A LOW IMPEDANCE TERMINATION MAY OCCUR ACROSS THE CONNECTING CIRCUIT SHALL BE PROVIDED WITH A SENDING PAD OF 15 DB OR MORE LOSS, EXCEPT WHEN CONNECTED TO -16 DBM, OR SD-1C372-01.

306. SENDING APPEARANCES FOR CONNECTING CIRCUITS SHALL NOT BE MULTIPLED EXCEPT AT MANUAL SWITCHBOARDS HAVING ADEQUATE BUSY TEST FEATURES.

307. THE FOLLOWING AREAS SHOULD HAVE EXCLUSIVE USE OF A MILLIWATT DISTRIBUTING SYSTEM: TOLL TESTBOARD, SWITCHING, MANUAL SWITCHBOARD, VOICE FREQ PATCH BAY, CARRIER EQUIPMENT, PRIVATE LINE TESTBOARD, PROGRAM, TELEGRAPH TEST AND ANY EQUIPMENT AREA NOT LOCATED NEAR OR UNDER CONTROL OF THE AREAS LISTED ABOVE. THIS LATTER EQUIPMENT AREA MAY CONTAIN THE FOLLOWING GROUPS OF EQUIPMENT: ECHO SUPPRESSOR BAYS, REPEATER BAYS, SIGNALING BAYS, ANNOUNCEMENT SYSTEMS, SERVICE OBSERVING EQUIPMENT, ATTC AND ASSOCIATED TEST FRAMES, AND MANUAL AND/OR AUTOMATIC TEST FRAMES.

308. THE ADMINISTRATION OF ALL OUTLETS FROM ONE MILLIWATT DISTRIBUTING SYSTEM SHOULD BE LIMITED TO A SINGLE PLANT ORGANIZATION WITHIN AN OPERATING COMPANY, ON THE SAME FLOOR AND IN THE SAME AREA OF THE BUILDING.

309. ALL CIRCUIT COMPONENTS ON THIS DRAWING HAVE BEEN CHOSEN FOR TEMPERATURE PERFORMANCE. COMPONENTS OF A DIFFERENT CODE OR UNCERTAIN TEMPERATURE CHARACTERISTICS SHOULD NOT BE SUBSTITUTED IN THE CIRCUIT COVERED BY THIS DRAWING WITHOUT CONSIDERATION OF THE EFFECTS ON OVERALL MILLIWATT-DISTRIBUTING STABILITY.

310. ON DRAWINGS COVERING CIRCUITS CONNECTING TO AN OUTLET OF THE 71 TYPE GENERATOR, THE FREQUENCY, LEVEL AND IMPEDANCE REQUIRED BY THE CONNECTING CIRCUIT SHOULD BE DESIGNATED AS FOLLOWS:

TO MILLIWATT DIST. CKT.

(FREQUENCY) (LEVEL) (IMPEDANCE)

RECORD OF FIGURES, WIRING AND APPARATUS CHANGES							
CHANGED ON ISS	IF JOB RECORDS DO NOT SPECIFY	THIS OPTION WAS FURN	SEE NOTE	USE IN CIRCUIT			
				STD	A&M	MD	
3B	Z OR Y	Z		Y		Z	
4B	W OR X	X		W		X	
6B	U OR V	V		U		V	
	FIG. B	FIG. A		FIG. B		FIG. A	
	RESISTORS		205	263A		221A	
7B	N OR M	N		M		N	
	T OR S	T		S		T	
	R OR U	U		R		U	

TABLE A

A PARTIAL LIST OF CONNECTING CKTS TO MW DIST CKT SEE NOTES 304, 305, 306, & 310	
SD-59432-01	TRANS MEAS CKT (VF CHAN PATCH BAYS)
SD-59433-01	NOISE MEAS CKT (VF CHAN PATCH BAYS)
SD-59972-01	MAINT CKT (TASI)
SD-68095-01	TEST LINE CKT (4W INTERTOLL)
SD-68445-01	ANNOUNCEMENT SYSTEM NO. 5A
SD-68446-01	AUTOMATIC TRANS T&C CKT (SEE NOTE 105)
SD-68544-01	JACK CKT T T UNIT NO. 5
SD-95101-01	SENDING JACK CKTS
SD-95147-01	SENDING PAD CKTS
SD-95162-01	REPEATER MEAS CKT (V_1 & V_3)
SD-95162-02	1000 CPS OUTLETS, REC JACKS & CONTROLS
SD-95608-01	ANNOUNCEMENT SYSTEM NO. 6A
SD-95698-01	TRANS & NOISE CHK CKT (SEE NOTE 105)
SD-95900-01	TRANS & NOISE MEAS CKT (TESTBOARDS)
SD-96519-01	TEST & MON CKT (FOR SIGNALING)
SD-97118-01	N2 CARRIER TELEPHONE APPLICATION SCHEM
SD-98100-01	TRANS TEST LINE CKTS
SD-95779-01	MF PULSING RECEIVER ADJUSTING CKT
SD-1A231-01	GROUND CROSS DETECTING CKT
SD-1A225-01	MILLIWATT & LOOP AROUND TEST CKT
SD-1A129-01	MISC CKT FOR ALL FRAMES
SD-1A139-01	RECORDED ANNOUNCEMENT CIRCUIT
SD-27727-01	ROTL CKT (NO.5 CSBR) (SEE NOTE 105)
SD-32521-01	SXS ROTL CKT (SEE NOTE 105)
SD-1C585-01	71J ACCESS PANEL CKT
SD-96618-01	71G PRECISION TONE GENERATOR CKT

TABLE B
SEE NOTE 102

IF ORDER SPECIFIES NETWORK APPLICATION FOR:	FURNISH OPTION
600 OHMS	D AND REMOVE LL
900 OHMS	REMOVE LL
SPARE	LL

TABLE C
SEE NOTES 110 AND 112

NO. OF NETWORKS PER FIG. 3 CONNECTED TO PAIR T3, R3 OF FIG. 2	NO. OF NETWORKS PER FIG. 3 AND DISTRIBUTING CIRCUITS PER SD-95000-01,-02 AND EQUIVALENT NETWORKS PER FS1 OF SD-1C372-01 CONNECTED TO PAIRS T,R,& T5,R5 OF FIG.2 (COMBINED TOTAL)	ARTIFICIAL LOAD RESISTORS (R) WHICH SHOULD BE CONNECTED PER	
		FIG. A	FIG. B
NONE	0 TO 2.5 3 TO 7.5 8 TO 12.5 13 TO 17.5 18 TO 22.5	11,12,13,14,15,16,17,18 14,15,16,17,18 15,16,17,18 14,16,17,18 15,17,18	11,12,13 11,12,14 11,12 11,13,14 11,13
	23 TO 27.5 28 TO 32.5 33 TO 37.5 38 TO 42.5 43 TO 47.5	14,17,18 17,18 14,18 18 14,15	11,14 11 12,14 12 13,14
	48 TO 52.5 53 TO 57.5 58 TO 60	15 14 NONE	13 14 NONE
5	0 TO 2 3 TO 7 8 TO 12 13 TO 17	14,17,18 17,18 14,18 18	11,14 11 12,14 12
	18 TO 22 23 TO 27 28 TO 32 33 TO 35	14,15 15 14 NONE	13,14 13 14 NONE
10	0 TO 2 3 TO 7 8 TO 10	15 14 NONE	13 14 NONE

DWG ISSUE	EE OR CD ISSUE	DATE ISSUED	DRAWN	APPD
1	1	1-23-63	TMS BJC AA	PJK BCB MEJ
2A	1 APP 1A	12-28-64	RRP MR	PJK BCB JJM
3B	1 APP 2B	12-28-64	RRP MR	PJK BCB JJM
4B	1 APP 3B	8-25-66	GTS DJG	PJK BCB WFO
5D	2D	10-7-68	WP ADG	PJK BCB WFO
6B	3B	10-27-72	RWW —	PJK TCA MEJ
7B	3B APP 1B	11/14/78	ZEN JNF	PJK TCA MEJ

NOTICE
NOT FOR USE OR DISCLOSURE OUTSIDE THE BELL SYSTEM EXCEPT UNDER WRITTEN AGREEMENT

EQUIPMENT INFORMATION
J94071D
J94071E
J94071F
ED-1C551-( )
ED-99702-( )

ISSUE 7B

REPLACES SD-95277-01 FOR 71C MW REF GEN AND 71D & 71E NETWORK PANELS

SD-95277-02 IN2O

COMMON SYSTEMS
TRANSMISSION MEASURING
MILLIWATT DISTRIBUTING CKT
USING 71F MILLIWATT REFERENCE GENERATOR

AT&TCO
STANDARD

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SD-95277-02-1

FIG. 1
GENERATOR CIRCUIT
J94071F

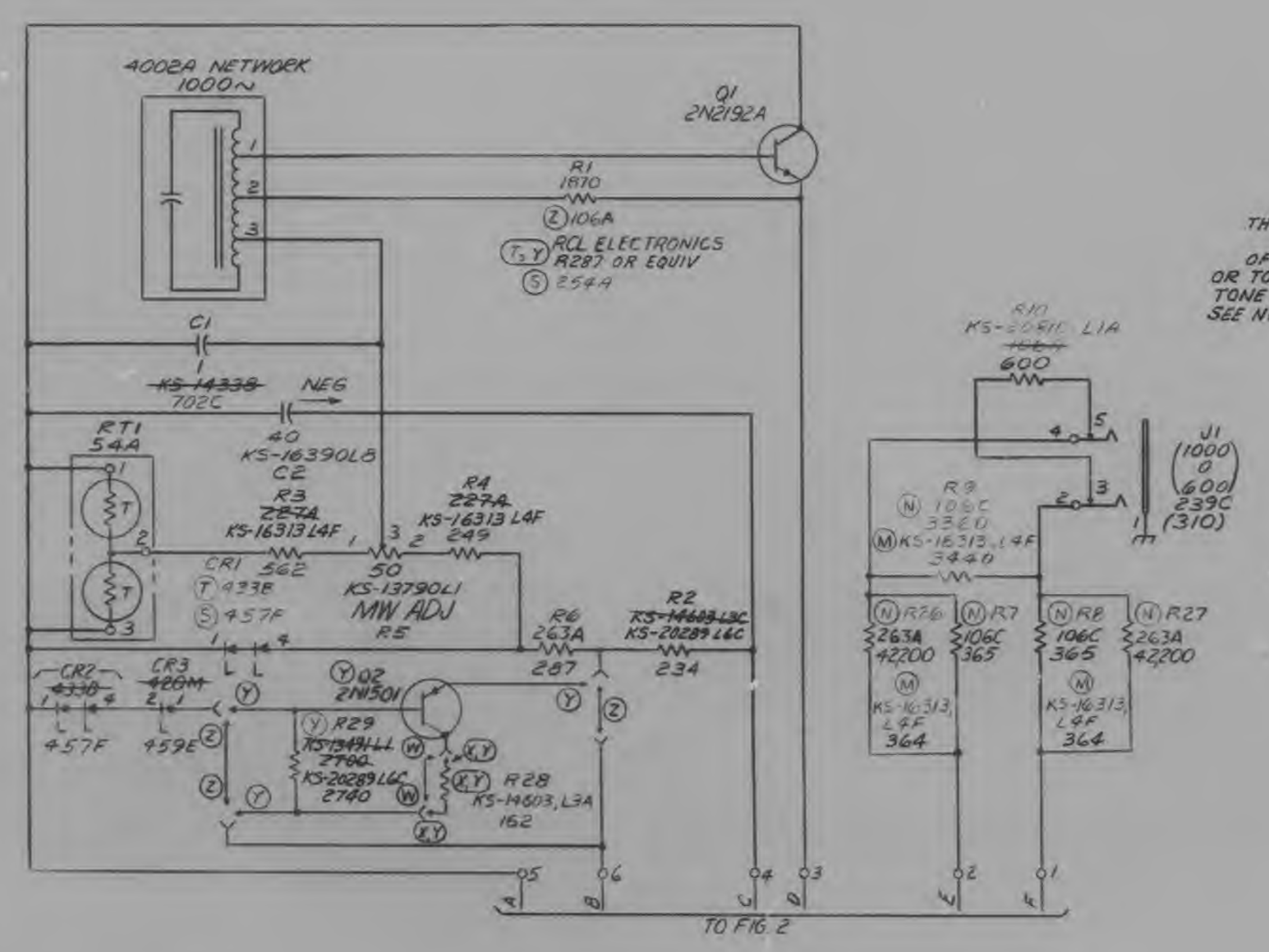


FIG. 3
600-OR-900-OHM DISTRIBUTING NETWORK
SEE NOTES 102, 104, 113, & 203

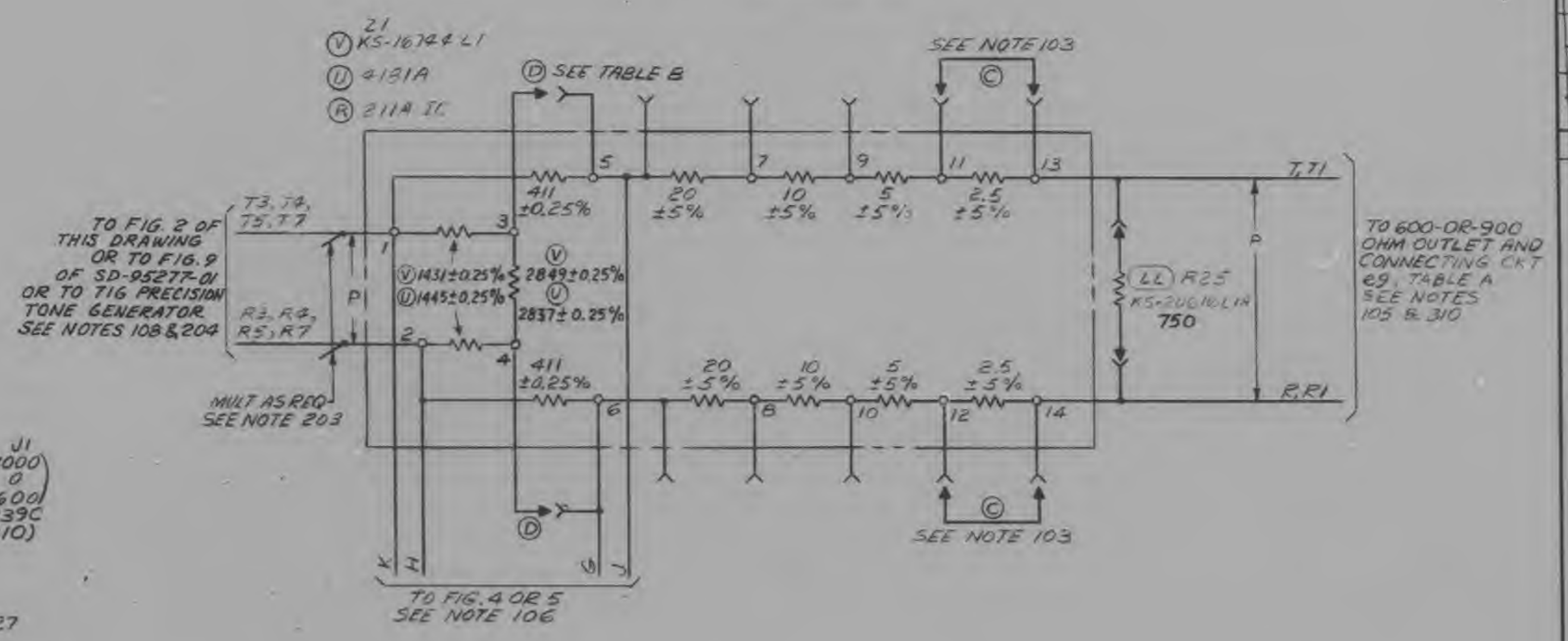

21
Ⓥ KS-16744 L1
Ⓤ 4131A
Ⓡ 211A IC
Ⓓ SEE TABLE B
SEE NOTE 103
Ⓒ
TO FIG. 2 OF THIS DRAWING OR TO FIG. 9 OF SD-95277-01 OR TO 71G PRECISION TONE GENERATOR SEE NOTES 108 & 204
T3, T4, T5, T7
R3, R4, R5, R7
MULT AS REQ - SEE NOTE 203
411
±0.25%
Ⓥ1431±0.25%
Ⓤ1445±0.25%
Ⓥ 2849±0.25%
Ⓤ 2837± 0.25%
20 ±5%
10 ±5%
5 ±5%
2.5 ±5%
Ⓛ R25
KS-20616 L1A
750
T, T1
R, R1
TO 600-OR-900 OHM OUTLET AND CONNECTING CKT e9, TABLE A SEE NOTES 105 & 310
TO FIG. 4 OR 5 SEE NOTE 106

FIG. A (MFR DISC.)
ARTIFICIAL LOAD STRAPPING
SEE NOTES 110 & 112 AND TABLE C

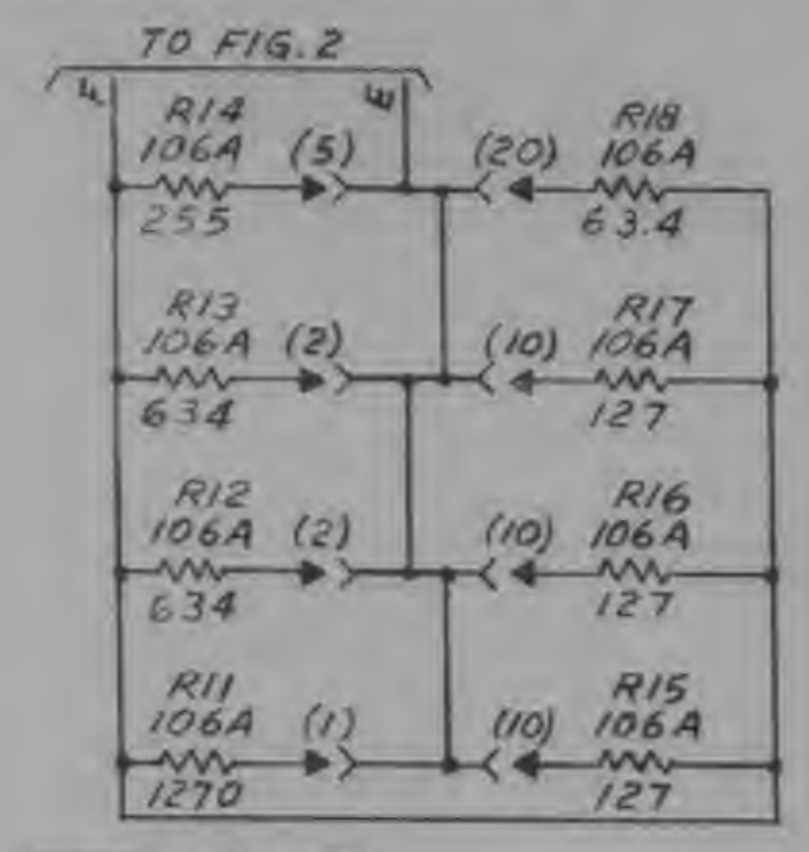
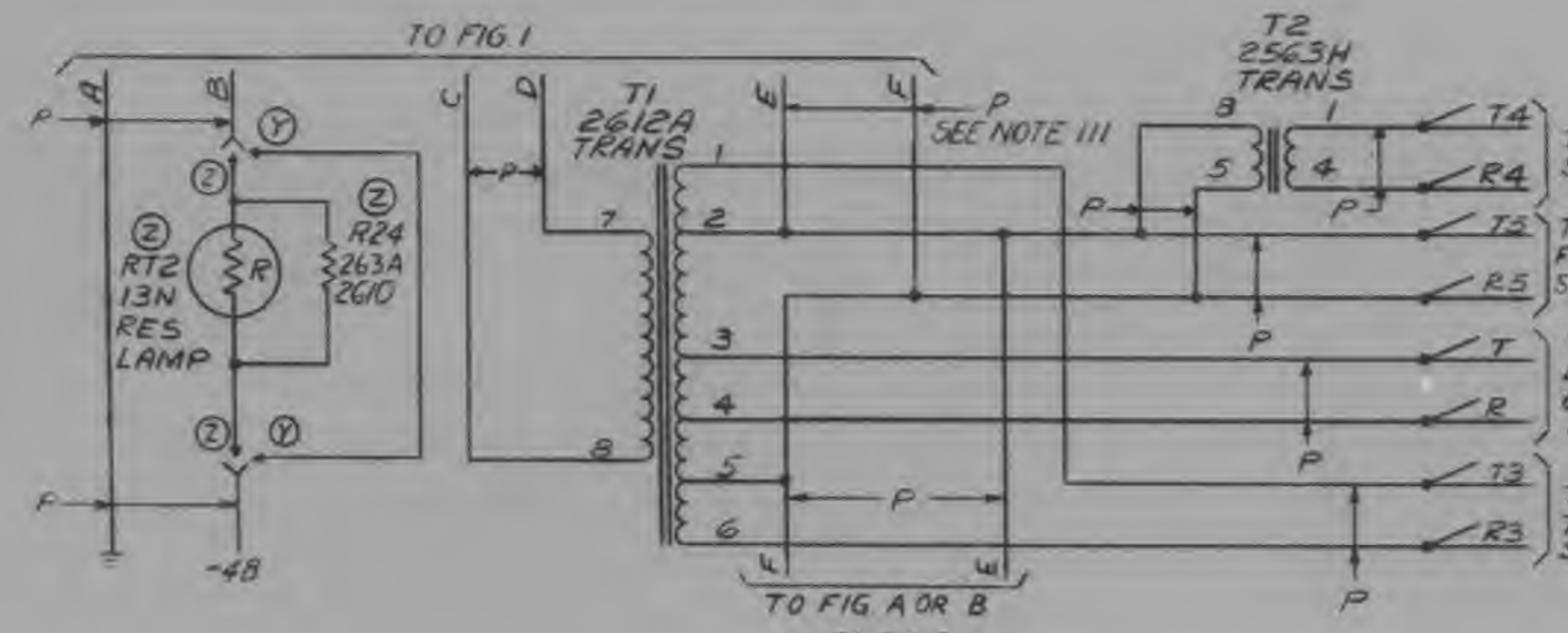


FIG. 2
BATTERY SUPPLY & LOAD CIRCUIT



TO MAX OF FIFTY (50) FIG 3
SEE NOTES 108 & 109

TO MAX OF FIFTY (50) FIG 3 OR
FORTY (40) FS1 OF SD-1C372-01
SEE NOTES 108, 109 & 112

TO MAX OF FIFTY (50) FIG. A,
B, C, E, OR J ON SD-95000-01
OR FIG. 3 OR 4 ON SD-95000-02
SEE NOTES 108 & 109

TO MAX OF
TEN (10) FIG. 3
SEE NOTES 108 & 109

FIG. 4
TO OBTAIN 0.5 dbM INTO 900 OHMS FROM TERMINALS 13 AND 14 OF FIG. 3 SEE NOTE 106.

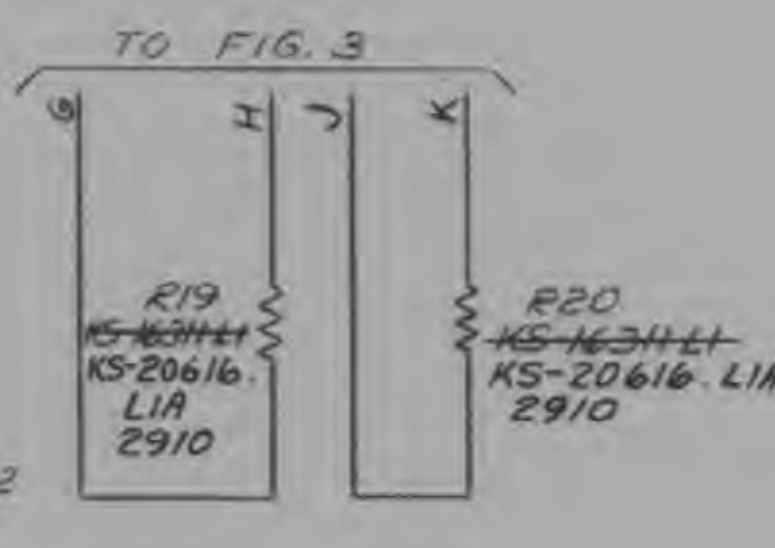
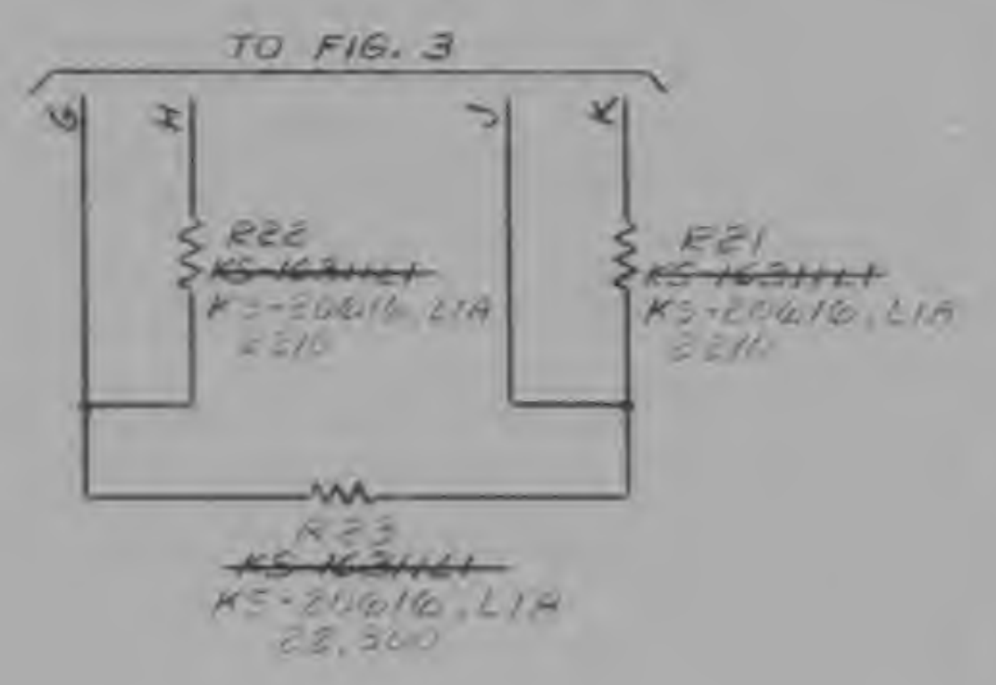
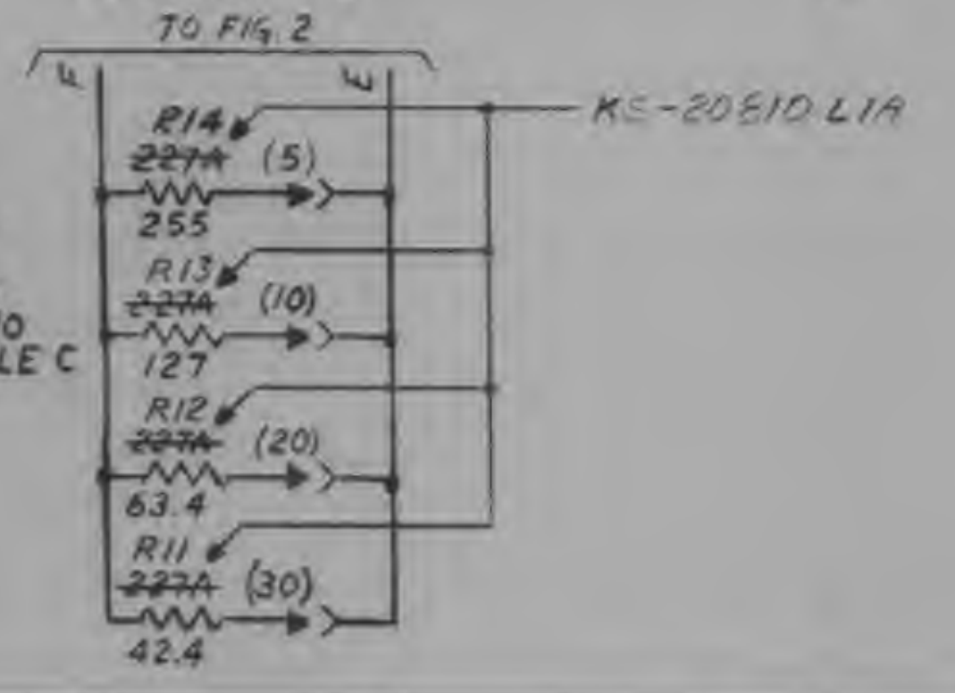


FIG. 5
TO OBTAIN +0.5 dbM INTO 600 OHMS FROM TERMINALS 13 AND 14 OF FIG. 3 WHEN USING OPTION Ⓓ, SEE NOTE 106.



HIGHEST RES & CAP USED ON THIS DWG	
R29	C2
NOT USED	

FIG. B
ARTIFICIAL LOAD STRAPPING
SEE NOTES 110 & 112 AND TABLE C



DRAWING ISSUE	
1	TMS AA MEA
2A	RRF MR JJN
3B	RRF MA LJN
4B	GA RJG WHO
5D	

ISSUE
7B

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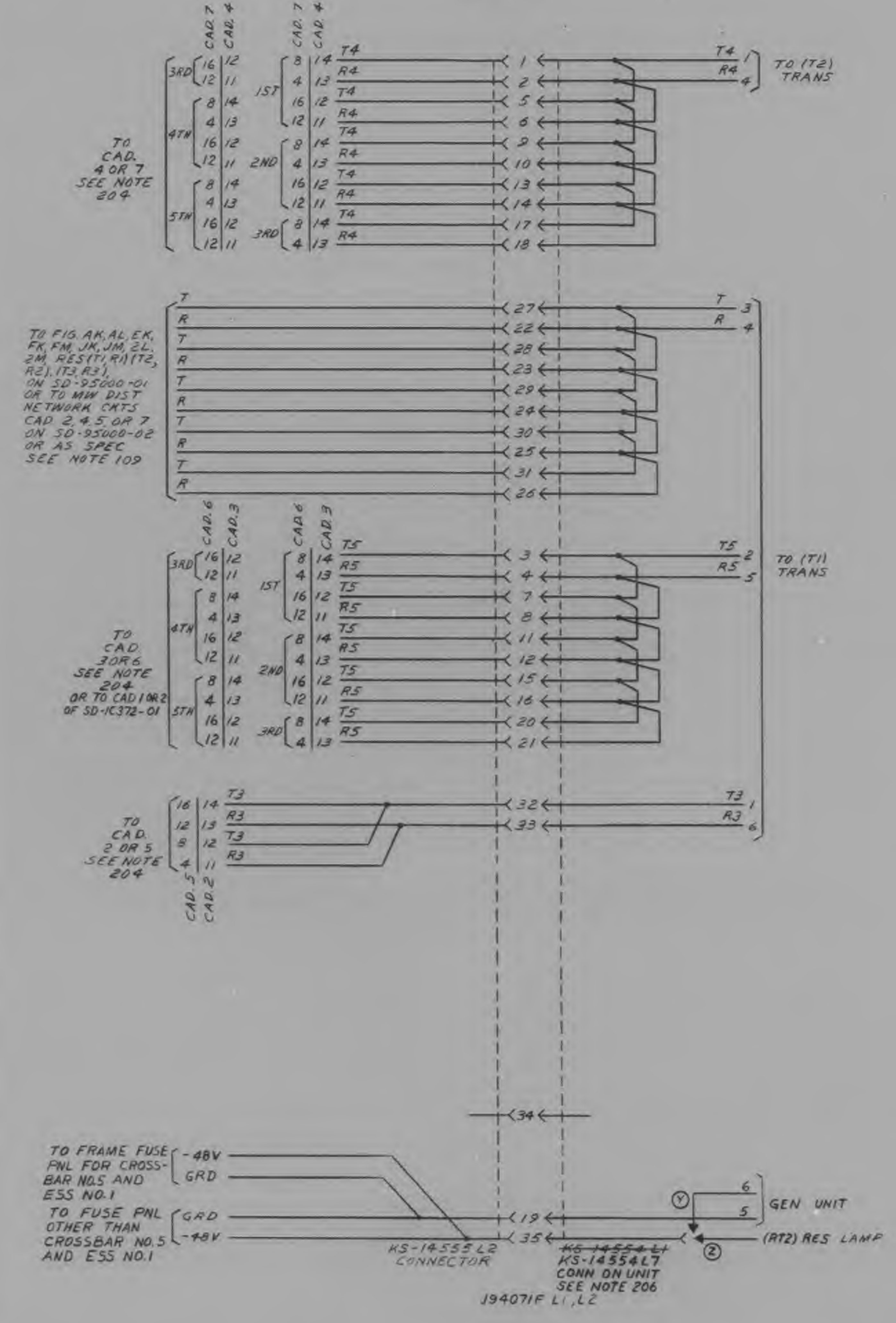
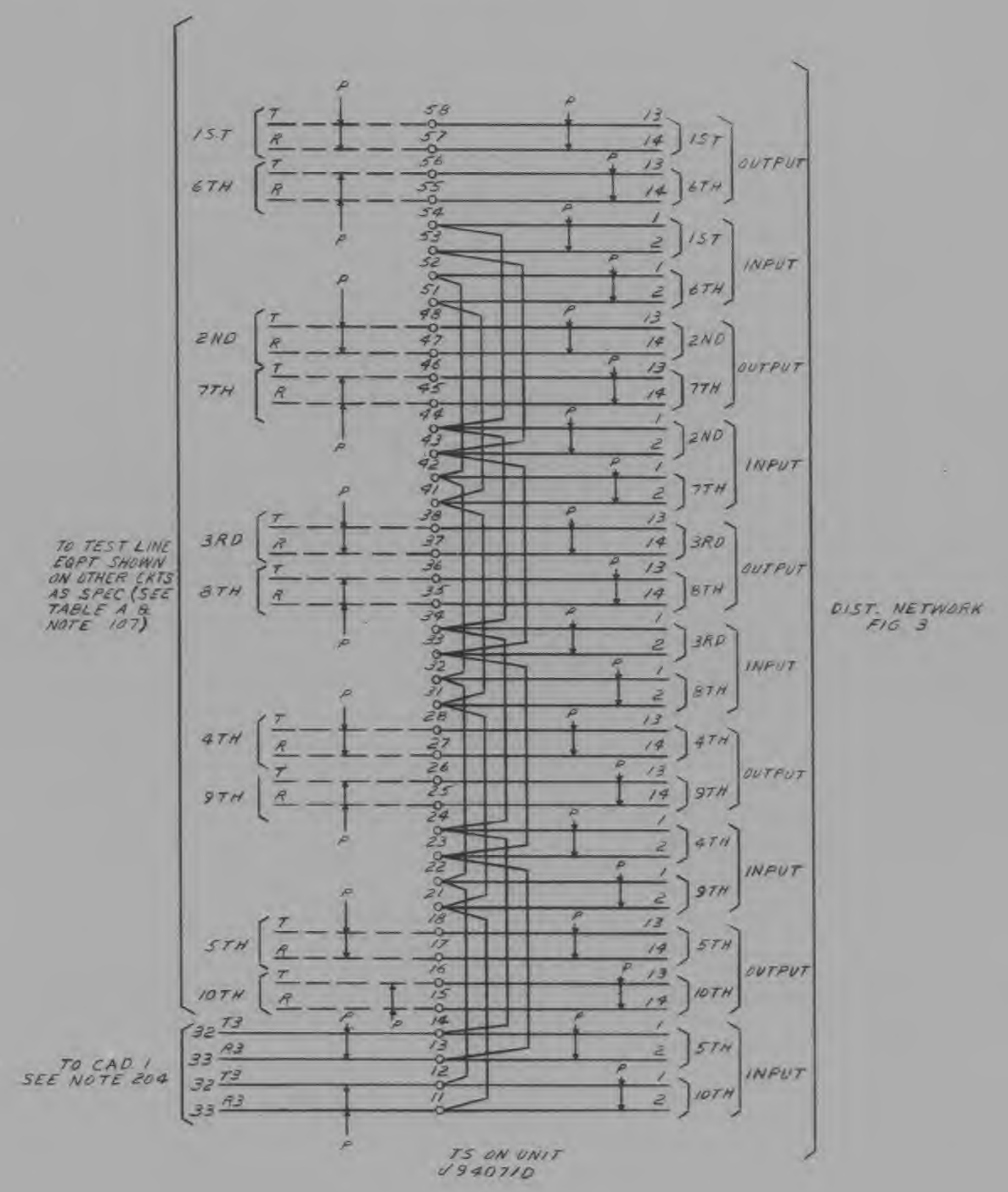
CAD. I
FOR FIG. 2


CAD. 7
CAD. 4
3RD
4TH
5TH
1ST
2ND
3RD
T4
R4
TO CAD. 4 OR 7 SEE NOTE 204
TO (T2) TRANS
TO FIG. AK, AL, EK, FK, FM, JK, JM, 2L, 2M, RES(T1, R1)(T2, R2), (T3, R3), ON SD-95000-01 OR TO MW DIST NETWORK CKTS CAD 2, 4, 5, OR 7 ON SD-95000-02 OR AS SPEC SEE NOTE 109
T
R
CAD. 6
CAD. 3
T5
R5
TO CAD. 3 OR 6 SEE NOTE 204 OR TO CAD 1 OR 2 OF SD-1C372-01
TO (T1) TRANS
T3
R3
TO CAD. 2 OR 5 SEE NOTE 204
CAD. 5
CAD. 2
34
TO FRAME FUSE PNL FOR CROSSBAR NO.5 AND ESS NO.1
-48V
GRD
TO FUSE PNL OTHER THAN CROSSBAR NO.5 AND ESS NO.1
GRD
-48V
19
35
KS-14555 L2 CONNECTOR
~~KS-14554 L1~~
KS-14554 L7 CONN ON UNIT SEE NOTE 206
J94071F L1, L2
Y
Z
6
5
GEN UNIT
(RT2) RES LAMP

CAD. 2
FOR FIG. 3



DRAWING ISSUE	
1	RA PBEI
2A	RRP MA JJW
3B	RRP MR JJW
4B	GTS OJG WRD
5D	

ISSUE 7B

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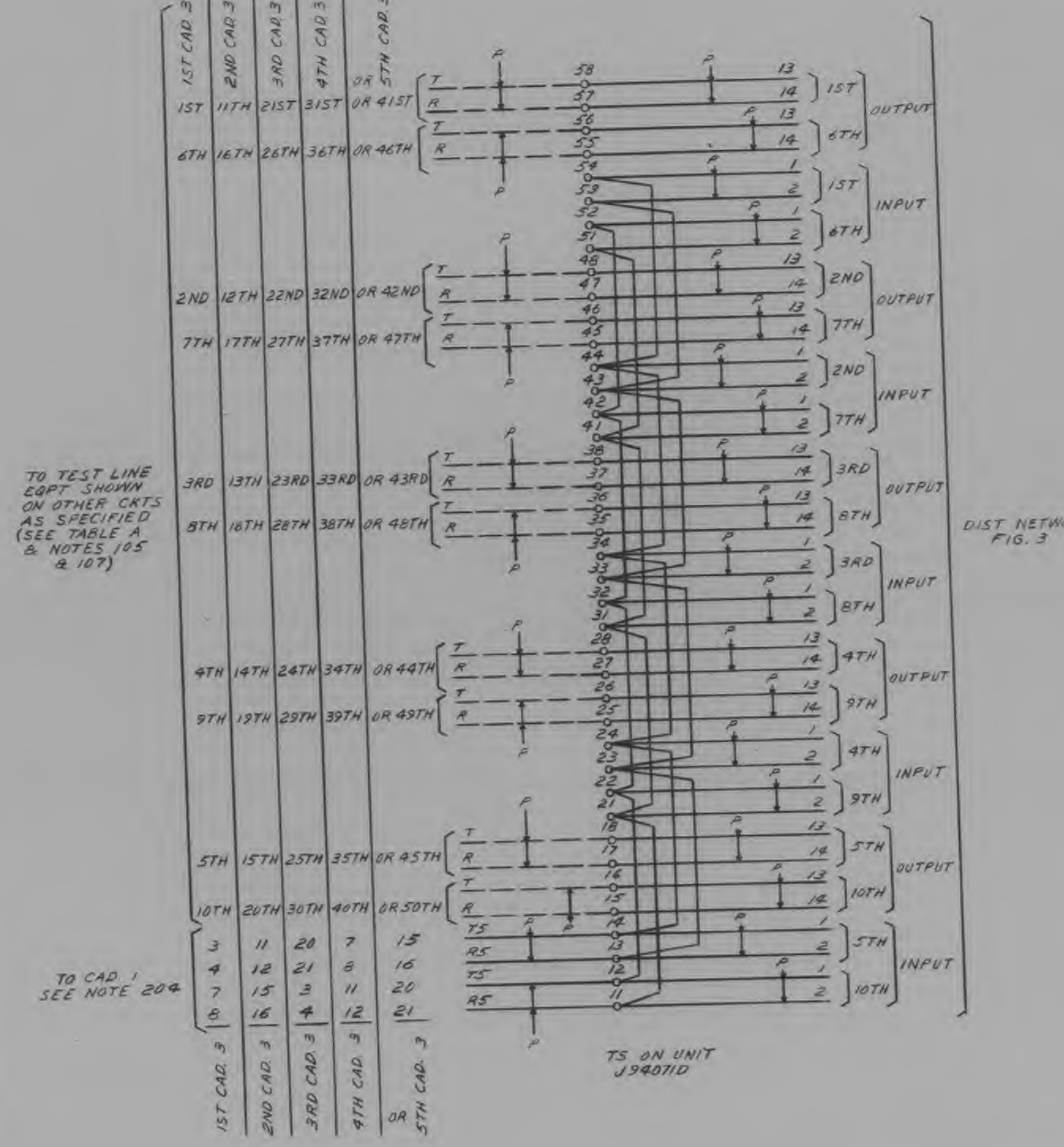
SD-95277-02-3

DRAWING ISSUE	
1	TMS AA MEJ
2A	RRF MR JJW
3B	RRF MR JJW
4B	GS DJG WRD
5D	

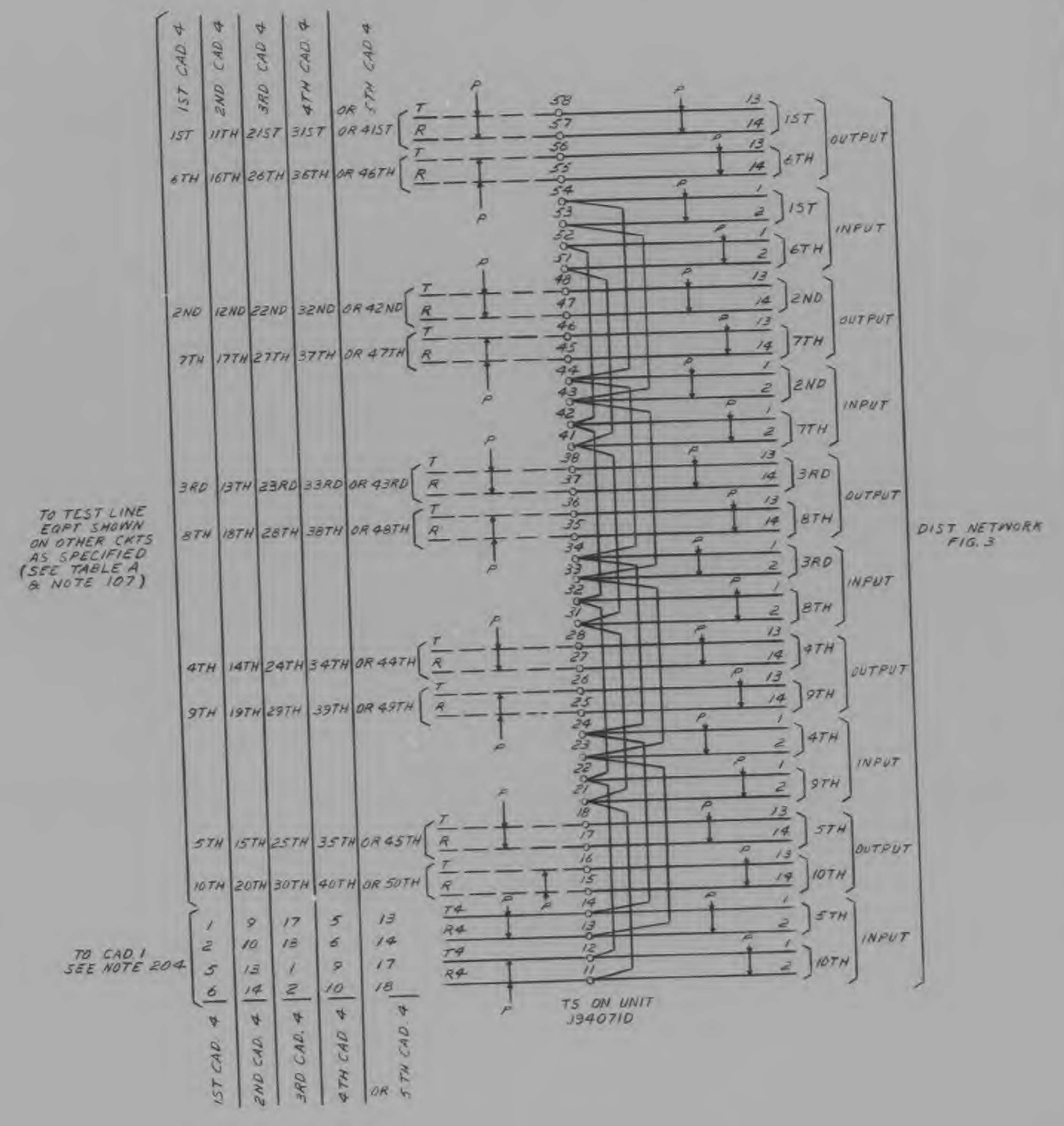
CAD. 3

FOR FIG. 3


1ST CAD 3
2ND CAD 3
3RD CAD 3
4TH CAD 3
OR 5TH CAD 3
1ST 11TH 21ST 31ST OR 41ST
6TH 16TH 26TH 36TH OR 46TH
2ND 12TH 22ND 32ND OR 42ND
7TH 17TH 27TH 37TH OR 47TH
3RD 13TH 23RD 33RD OR 43RD
8TH 18TH 28TH 38TH OR 48TH
4TH 14TH 24TH 34TH OR 44TH
9TH 19TH 29TH 39TH OR 49TH
5TH 15TH 25TH 35TH OR 45TH
10TH 20TH 30TH 40TH OR 50TH
TO TEST LINE EQPT SHOWN ON OTHER CKTS AS SPECIFIED (SEE TABLE A & NOTES 105 & 107)
TO CAD 1 SEE NOTE 204
3 11 20 7 15
4 12 21 8 16
7 15 3 11 20
8 16 4 12 21
1ST CAD. 3
2ND CAD. 3
3RD CAD. 3
4TH CAD. 3
OR 5TH CAD. 3
T
R
T5
R5
P
TS ON UNIT J94071D
OUTPUT
INPUT
1ST
6TH
2ND
7TH
3RD
8TH
4TH
9TH
5TH
10TH
DIST NETWORK FIG. 3

CAD. 4

FOR FIG. 3


1ST CAD 4
2ND CAD 4
3RD CAD 4
4TH CAD 4
OR 5TH CAD 4
1ST 11TH 21ST 31ST OR 41ST
6TH 16TH 26TH 36TH OR 46TH
2ND 12TH 22ND 32ND OR 42ND
7TH 17TH 27TH 37TH OR 47TH
3RD 13TH 23RD 33RD OR 43RD
8TH 18TH 28TH 38TH OR 48TH
4TH 14TH 24TH 34TH OR 44TH
9TH 19TH 29TH 39TH OR 49TH
5TH 15TH 25TH 35TH OR 45TH
10TH 20TH 30TH 40TH OR 50TH
TO TEST LINE EQPT SHOWN ON OTHER CKTS AS SPECIFIED (SEE TABLE A & NOTE 107)
TO CAD 1 SEE NOTE 204
1 9 17 5 13
2 10 18 6 14
5 13 1 9 17
6 14 2 10 18
1ST CAD. 4
2ND CAD. 4
3RD CAD. 4
4TH CAD 4
OR 5TH CAD. 4
T
R
T4
R4
P
TS ON UNIT J94071D
OUTPUT
INPUT
1ST
6TH
2ND
7TH
3RD
8TH
4TH
9TH
5TH
10TH
DIST NETWORK FIG. 3

ISSUE 7B

MILLIWATT DISTRIBUTING CKT
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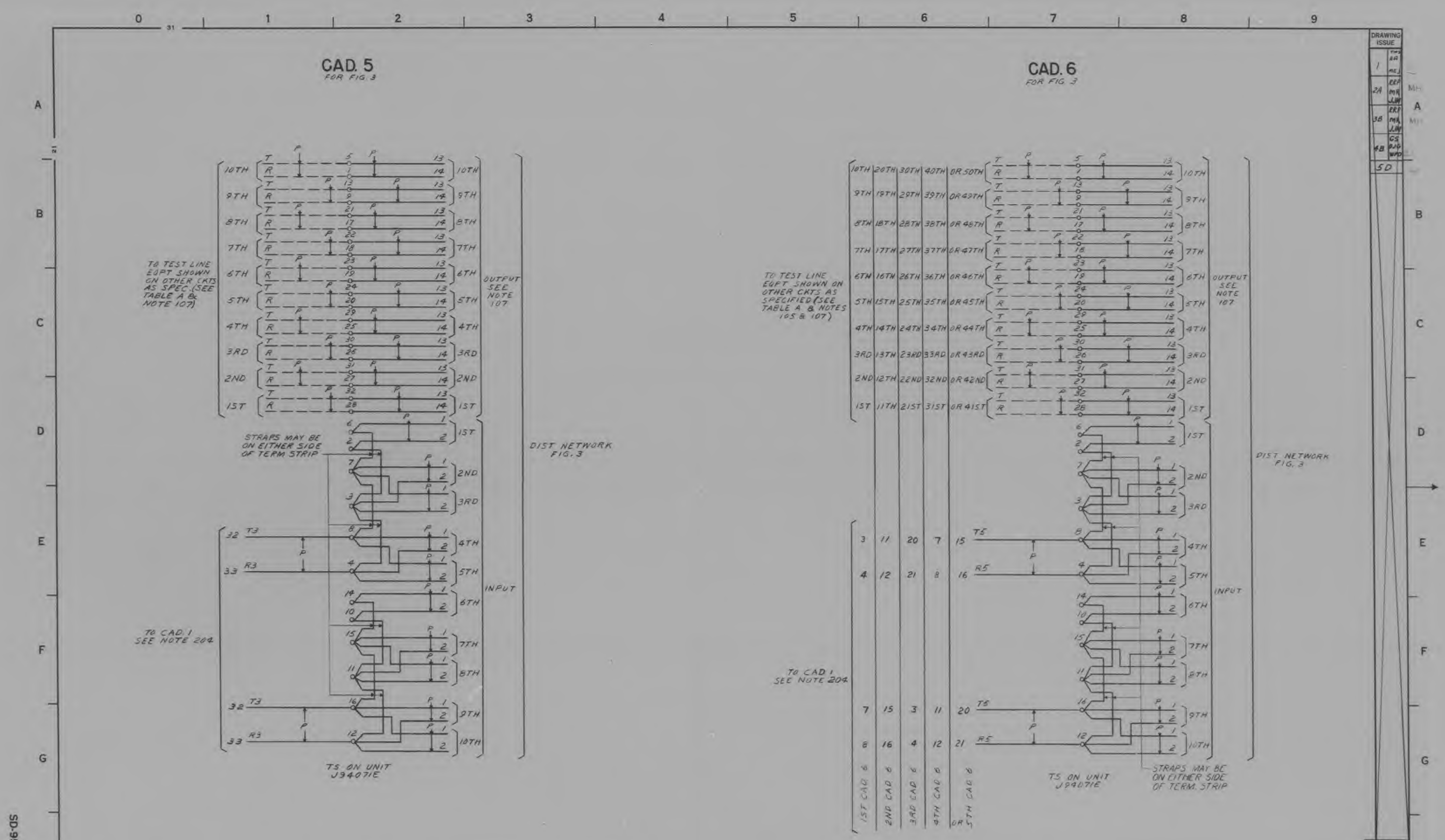
CAD. 5
FOR FIG. 3
CAD. 6
FOR FIG. 3
10TH
9TH
8TH
7TH
6TH
5TH
4TH
3RD
2ND
1ST
TO TEST LINE EQPT SHOWN ON OTHER CKTS AS SPEC. (SEE TABLE A & NOTE 107)
OUTPUT SEE NOTE 107
STRAPS MAY BE ON EITHER SIDE OF TERM STRIP
DIST NETWORK FIG. 3
INPUT
TO CAD 1 SEE NOTE 204
T3
R3
TS ON UNIT J94071E
10TH 20TH 30TH 40TH OR 50TH
9TH 19TH 29TH 39TH OR 49TH
8TH 18TH 28TH 38TH OR 48TH
7TH 17TH 27TH 37TH OR 47TH
6TH 16TH 26TH 36TH OR 46TH
5TH 15TH 25TH 35TH OR 45TH
4TH 14TH 24TH 34TH OR 44TH
3RD 13TH 23RD 33RD OR 43RD
2ND 12TH 22ND 32ND OR 42ND
1ST 11TH 21ST 31ST OR 41ST
TO TEST LINE EQPT SHOWN ON OTHER CKTS AS SPECIFIED (SEE TABLE A & NOTES 105 & 107)
T5
R5
1ST CAD 6
2ND CAD 6
3RD CAD 6
4TH CAD 6
OR 5TH CAD 6
DRAWING ISSUE
1
2A
3B
4B
5D
SD-95277-02-5

ISSUE
7B

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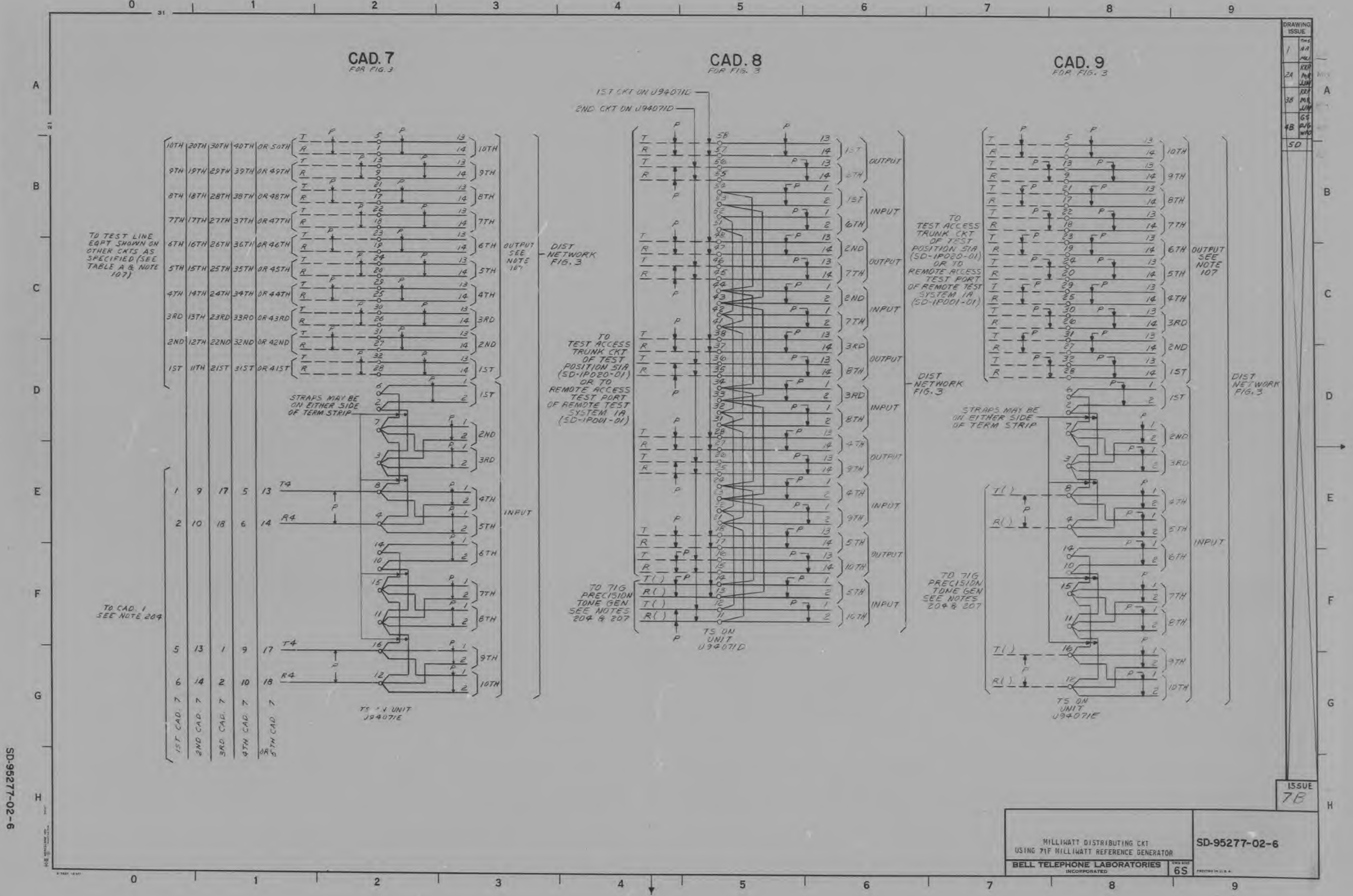
CAD. 7
FOR FIG. 3
TO TEST LINE EQPT SHOWN ON OTHER CKTS AS SPECIFIED (SEE TABLE A & NOTE 107)
10TH 20TH 30TH 40TH OR 50TH
9TH 19TH 29TH 39TH OR 49TH
8TH 18TH 28TH 38TH OR 48TH
7TH 17TH 27TH 37TH OR 47TH
6TH 16TH 26TH 36TH OR 46TH
5TH 15TH 25TH 35TH OR 45TH
4TH 14TH 24TH 34TH OR 44TH
3RD 13TH 23RD 33RD OR 43RD
2ND 12TH 22ND 32ND OR 42ND
1ST 11TH 21ST 31ST OR 41ST
OUTPUT SEE NOTE 107
DIST NETWORK FIG. 3
STRAPS MAY BE ON EITHER SIDE OF TERM STRIP
INPUT
TO CAD. 1 SEE NOTE 204
T4
R4
1ST CAD. 7
2ND CAD. 7
3RD CAD. 7
4TH CAD. 7
OR 5TH CAD. 7
TS ON UNIT J94071E
CAD. 8
FOR FIG. 3
1ST CKT ON J94071D
2ND CKT ON J94071D
TO TEST ACCESS TRUNK CKT OF TEST POSITION 51A (SD-1P020-01) OR TO REMOTE ACCESS TEST PORT OF REMOTE TEST SYSTEM 1A (SD-1P001-01)
TO 71G PRECISION TONE GEN SEE NOTES 204 & 207
OUTPUT
INPUT
DIST NETWORK FIG. 3
TS ON UNIT J94071D
CAD. 9
FOR FIG. 3
TO TEST ACCESS TRUNK CKT OF TEST POSITION 51A (SD-1P020-01) OR TO REMOTE ACCESS TEST PORT OF REMOTE TEST SYSTEM 1A (SD-1P001-01)
STRAPS MAY BE ON EITHER SIDE OF TERM STRIP
TO 71G PRECISION TONE GEN SEE NOTES 204 & 207
OUTPUT SEE NOTE 107
INPUT
DIST NETWORK FIG. 3
TS ON UNIT J94071E
DRAWING ISSUE
1 AA MLJ
2A RRP MR JJW
3B RRP MR JJW
4B GS PJG WRO
5D

ISSUE 7B

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